Excavating Engineer

founded 1905

NOVEMBER 1960

Barge-mounted dragline clears stumps and vegetation as it cuts pilot canal for new navigation channel at Houma, La. See story on page 4.

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South Milwaukee, Wisconsin

Volume 54 No. 11 **November 1960**

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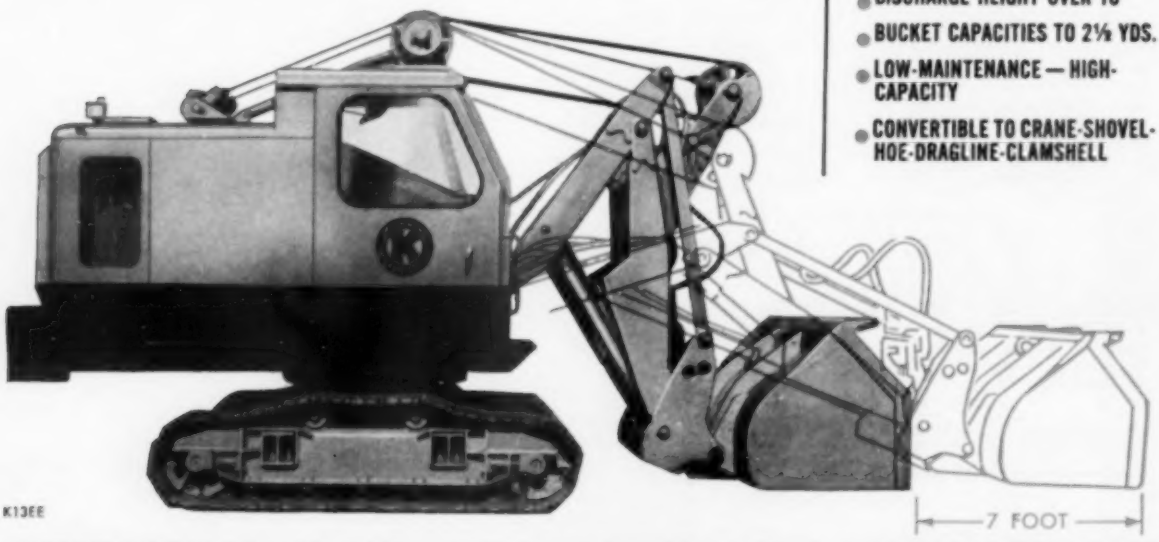

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A report on the Koehring Skooper
by W. C. Ratliff
General Superintendent
Sunniland Lime Rock Company
Sunniland, Florida

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NOVEMBER 1960

Short Route to the Gulf

New 36-mile navigation canal will make Houma one of Louisiana's bustling seaports. Barge-mounted draglines and dredges dig 21.2 million yards of channel excavation.

LET'S do it ourselves! That, in a nutshell, was the report of a citizens' committee appointed to see how Houma, La., located 36 miles from the coast, could become a seaport.

The committee reported that getting federal approval for a navigation canal to the Gulf Coast would probably take many years. Various federal agencies would have to complete studies and reports, and congress would have to authorize the project and appropriate money.

The Terrebonne Parish Police Jury (county board), which had appointed the committee, followed through on its recommendation and floated a $3.5 million bond issue. The Louisiana department of public works was called in to find the best route, complete the necessary engineering work and supervise construction.

Reject Present Routes

The Terrebonne Parish canal committee advised against attempting to improve any of the existing bayous which wind from Houma to the sea. Bayous du Large, Grand Caillou, Petit Caillou and Terrebonne are all navigable to some extent and are used by fishing boats and other small craft stationed at Houma. But their wandering courses, shallow channels, and concentrations of developments along the banks make these streams unsuitable for improvement.

The study urged, instead, a new direct sea-level route to the Gulf, between Bayous du Large and Grand Caillou. The route was surveyed, plans and specifications drawn, and bids called for on an estimated 21.2 million cubic yards of excavation, making it one of the biggest earth-moving jobs in recent Louisiana history. A contract was awarded to Walter P. Villere Co., New Orleans, La., for the entire channel cut on a bid of $0.13528 per cubic yard. The canal will have a bottom width of 150 feet, 1 on 2 side slopes and top width averaging about 225 feet.

In the wake of a launch is Walter P. Villere's Monighan model 6150. The 32-year-old dragline swings a 10-yd. bucket.

The Houma canal passes through typical Louisiana deep delta country. Its northern end will connect with the Intracoastal Waterway which passes through Houma. Ground elevation at this point is seven feet above mean sea level. In the first half mile the average ground elevation drops to two feet. For the next 24 miles the average elevation hovers between two and one foot msl. The final 12 miles are almost entirely in open water, including eight miles in Terrebonne Bay and four in the Gulf of Mexico.

The northernmost half-mile of the canal route crosses farmland, but the rest of the route is uninhabited bayou swampland covered with thick brush and tall, moss-draped trees, and interspersed with open marshes. The right-of-way crosses numerous small bayous and shallow lakes.

Four Parts

Villere divided the big project into four parts. The largest of the four (almost half of the canal length) is being completed by Villere with his own men and equipment. The other three parts are being built by subcontractors.

On southernmost 10 miles of the canal, F. J. J. Sloat Dredging Co., Slidell, La., is digging the canal with a 16-in. diesel powered dredge, the *Mooreland II*. Sloat sublet a portion of this work to Jahncke Service, Inc., New Orleans, which has the *Manchac*, a 20-in. diesel-electric dredge, on the job. About one-third of the entire 2 million yards of excavation will be handled by dredging.

Water depths along this portion of the right-of-way range from three to seven feet. Final grade of the canal will be 16 feet below mean sea level, with one foot allowable overdepth. In open waters spoil must be placed at least 700 feet from the channel.

The next seven miles above Sloat's job is subcontracted to Monroe J. Wolfe Co., New Orleans. This section includes about two miles in open water and another five in open marshes and shallow lakes. Wolfe is completing most of the excavation by hydraulic methods, after cutting a pilot canal with a barge-mounted dragline.

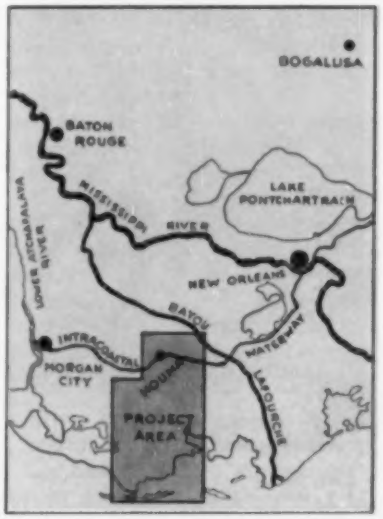
On Villere's 17-mile segment two big earthmovers are eating their way through the primeval swamp. The first is a barge-mounted Bucyrus-Erie 200-W walking dragline. This is followed by a Monighan 6150 walker, also barge-mounted. In a few scattered portions of the cut, where right-of-way restrictions require that spoil be placed well beyond the reach of the draglines, a dredge will complete the excavation.

Villere's contract calls for clearing of the 600-ft. wide right-of-way, but this consisted merely of slashing timber in the wooded areas and was quickly completed by crews with chain saws.

The contractor's barge-mounted machines were towed in from the gulf through a network of bayous, without prior dredging. The 200-W is fitted with a 6-yd. Yaun clamshell bucket on a 150-ft. boom. A Cooper-Bessmer diesel powers the machine. The big clam digs a pair of pilot canals, one along each bank of the future canal, just deep enough to provide flotation for its own barge and the bigger barge that carries the Monighan.

Slashed wood is cast aside by the 200-W, and stumps of the felled trees are plucked from the mire with the big clamshell bucket. Then the bucket bites into the soft, spongy organic matter, tears it out and swings it to the bank to build a small retaining dike that will hold back the bigger spoil pile that the Monighan will create. A 75-ft. berm is maintained between the newly cut bank and the spoil pile.

Doing the deeper digging is the 6150 with a 10-yd. Hendrix bucket on a 150-ft. boom. The bucket was specially made to Villere's design by Hendrix Manufacturing Co., Inc., Mansfield, La. Longer and lighter than Hendrix' standard 10-yd. bucket, the Villere bucket has tough, thin lips of stainless steel.



Existing waterways connecting Houma to the Gulf are navigable to small craft. New navigation canal will bottom at 16 feet below mean sea level.

Superintendent for Villere on the Houma job is J. E. Jordan, shown here inspecting fittings on custom-built Hendrix bucket. In background on the barge is the Monighan machine.

The bucket was designed especially for excavating the tough, white sea sand encountered under the layers of organic material and silt. Superintendent J. E. Jordan complains that "the bottom of the cut is like concrete."

The Monighan 6150 has undergone many modifications in its 32 years of service in the Mississippi delta. The diameter of its big tub was increased with a built-on strip around the circumference. The machine's shoes were trimmed on the inside edges to provide clearance for the larger tub.

Powering the Monighan is a Busch-Sulzer 650-hp supercharged diesel that formerly saw service as the powerplant of a seagoing tug. The engine's six cylinders have a 13-in. bore and 17-in. stroke. A 350-psi air res-

ervoir activates the starter. Air pressure is built up by a Gardner-Denver single-stage compressor powered by a Hercules 4-cylinder gasoline engine. The diesel also turns a 250-volt generator that powers swing motors and provides power for the dragline's auxiliary equipment including 6,000 watts of lights on the boom used during night operation.

Pilot Canals

Working from the pilot canals cut by the 200-W, the 6150 makes half of the final cut from each side and casts the material beyond the dike built by the smaller machine. The combined output of the two floating excavators averages 500,000 yards a month. Each machine handles about half of this total.

Because the Monighan is digging deeper and swinging wider, it does not move more material than the Bucyrus-Erie despite the greater bucket capacity of the older machine.

Access to the Villere job is possible only by boat. Machine operators are ferried back and forth to the nearest land that is accessible by car, and all fuel and supplies must also be ferried to the machines. The nearby Cenac Towing Co. delivers diesel fuel to the job site in 20,000-gallon lots to keep ahead of the two draglines' combined appetite of about 650 gallons a day. Villere keeps a spare barge on the job for extra dragline buckets, spare parts, maintenance equipment and other supplies.

The two machines are often a couple miles apart, and Superintendent Jordan keeps in touch with dragline operators from his floating office, a boat equipped with a two-way radio.

Jordan reeves the two machines with Macwhyte wire rope. Tough digging in sand shortens cable life on the 6150, Jordan reported. The machine's 1⅝-in. drag rope lasts about nine weeks if it is turned end-for-end after about half of the period. The three-part hoist line is 1 inch in diameter. Sand digging also necessitates frequent hardfacing for buckets and chains.

Villere's contract also calls for erec-

Channel Will Generate Traffic

OFFSHORE oil drilling rigs clustered along the Louisiana coast will be easier to reach when the Houma Navigation canal is completed. Most of the tonnage that presently plies the bayous between Houma and the Gulf consists of supplies for the offshore drillers. During 1957, about 1.3 million tons were carried on Bayou Terrebonne, the principal natural watercourse to the sea. This total includes 700,000 tons of water, 200,000 of pipe and casing and 50,000 of drilling muds for the offshore rigs.

But Bayou Terrebonne has a controlling depth of only five feet, and many vessels are forced to use the more distant, deeper waterways to reach their destinations. Some offshore rigs along the coast of Terrebonne parish are supplied by way of the Atchafalaya river, Bayou Boeuf or from New Orleans. With the completion of the Houma Canal many oil rig suppliers are expected to set up headquarters in Houma and travel to their drilling rigs by this new direct route.

In addition to oil and gas, Terrebonne parish is an important cen-

ter of shrimp, crab and oyster production, and the big fishing fleet that operates out of Houma will save valuable time reaching their fishing grounds by way of the new canal.

Other commodities produced in the parish which will become cargo on the new canal include sugar, furs, hides, meat products and lumber.

With an eye to the future, Terrebonne parish also plans to provide choice industrial sites along the northern end of the canal where the terrain is suitable for building.

Deeper Channel

Another source of extra traffic for the new canal is seen in the rapidly increasing tonnage carried on the Gulf Intracoastal Waterway through Houma. During 1957, 33 million tons passed through the city on the waterway—more than double the 1947 tonnage. The Houma Navigation Canal will have a controlling depth of 18 feet—four feet deeper than the Intracoastal Waterway.

Houma has high hopes of seeing a new period of growth start with the completion of its new gateway to the gulf.

George Metzgar of the Villere firm checks 6-yd. Yaun clamshell bucket handled by Bucyrus-Erie 200-W dragline.

Raymond Tatford is general superintendent for Deep Delta Const. Co., a subcontractor which is completing the northernmost two miles of the canal. In the background is Manitowoc 4500 which carries a 120-ft. boom and a 5½-yd. bucket.

tion of 11 navigational aids consisting of channel marking lights on timber piling clusters in the open waters along the southern end of the canal. This work was subcontracted by C. S. Thorguson Co., Berwick, La.

North of the Villere excavation section another subcontract was let for the final two miles of the new canal. Here the contractor is Deep Delta Const. Co., Inc., a subsidiary of James P. Cross Co. The firm is moving about 1.5 million cubic yards by two different methods. On the northern end where the new canal will connect with the Intracoastal Waterway, a flotation ditch is being dug to provide access for a dredge which will complete the excavation. The canal will widen to 400 feet at the junction to provide turning room for long tows.

For the most of its two miles, Deep Delta is completing the cut to final dimensions with two Manitowoc draglines, a 3900 and 4500. The smaller machine has a 90-ft. boom and a 3½-yd. bucket; the 4500 carries 120 feet of boom and a 5½-yd. bucket. A Caterpillar diesel powers the 4500, and a Cummins diesel powers the 3900. Both machines work on mats.

The smaller Manitowoc goes ahead of its larger partner casting the slashed timber aside and making an initial cut about nine feet deep. With this material it builds small dikes to hold back spoil piles, similar to the procedure on the Villere job. The 4500 completes the excavation, cutting half the big ditch from each side. Ground elevation along this stretch averages little more than 1 msl.

Raymond Tatford, general superintendent on the job, noted that his Manitowoc 4500 is a veteran of 12 years work in the bayou country and was one of the first 4500's to be used in the South. The machine is mounted on crawlers with 25-ft. long frames and 60-in. wide treads.

Tearing out big stumps with the draglines is the toughest part of the Houma canal job, Tatford reported. Material around some of the larger stumps must be dug out first to loosen them up. Light organic material and silty clay make up most of the excavation on the Cross section. The abrasive sand that makes for tough digging on Villere's job has not been encountered by Tatford.

The Cross crew had been on the job for five months when *Excavating Engineer* visited the job, and was staying on schedule, Tatford said. Best month's production was 160,000 yds.

The Villere spread had moved almost 11 million yards, and its operation was running well ahead of schedule.

Tides in this deep delta region vary from —6 to +3 msl, and when the high tide rolls in the landscape changes radically in appearance. The marshes virtually disappear from view, and the barge-mounted excavators look like they're on the high seas. When the machines are working in wooded areas, the tidal effect is less noticeable.

Salt Intrudes

Ordinarily the shallow lakes and marshes along the right-of-way contain fresh water, but salt water follows Villere's draglines up the newly cut channel. Working from the north end of the route toward the south, the Cross men are surrounded by fresh water, and observe only a slight tidal effect.

The only observers of this history making earthmoving effort are the handful of Cajons who live in the area and sometimes pass the job as they travel along the network of bayous in their boats. And the only "sidewalk superintendents" are a few disinterested alligators.

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"What are these conditions? Take bad grades or soft underfooting. Our versatile DW21s handle these with comparative ease. When we can take advantage of their high speed on long hauls, we use our high production DW20s. And when we have to work in tight quarters where maneuverability is essential, we bring in our smaller 619s. This doesn't mean any of them sit idle when these conditions don't exist. We simply take care of the special conditions with the best suited machines, and put the rest to work on other jobs.

"Take a look at typical assignments. The DW20s and DW21s are working on highway projects. Hauls up to two miles permit efficient use of the high travel speeds of the four-wheel DW20s. Steep grades, particularly around Conway Summit, are best handled by the two-wheel DW21s. The 619s easily handle dirtwork in the deep narrow channels of the San Lorenzo Creek Flood Control Project.

"Of course, a major consideration is their ability to do this month in and month out, with little lost time for maintenance. They must be, and are, ready to work when we need them, and able to stay on the job until the work is done. This combination of high production, ability to handle any job and low maintenance helps us move our dirt fast at the lowest possible cost."

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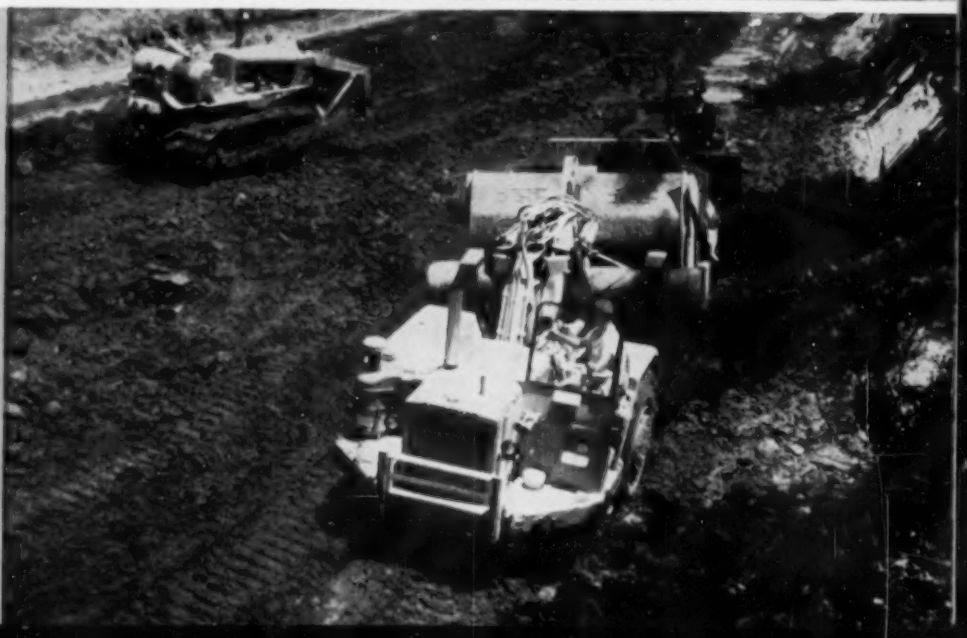


Small Contractors Can Be Leaders

Two young New Yorkers prove in Tucson, Ariz., that a new construction business can command respect.

by Ray Day

THERE'S a defeatist line of thinking abroad in the land today which goes like this—it's impossible to start a construction business anymore unless you're financed well beyond six figures, and that you stand little chance of succeeding even then. A lot of people believe that theory, and never do get started.

This makes it fine for people like Bud Young and Bill Deyoe, of Tucson, Ariz. They didn't believe in defeatist thinking. As a result, two years after they moved from New York to Tucson, they're regarded as leaders in specialized types of excavating.

When rocky ground or cemented conglomerate stop trench excavation cold, pipeline and sewer contractors long established in the Tucson area tell their superintendents, "Call Young and Deyoe. They don't know it can't be dug . . . and they'll have it excavated by Saturday morning!"

Plumbing and swimming pool contractors have learned to call on the skills of these two young men to make their excavation performance more dependable.

Young and Deyoe have one trade secret which they rank above all others. They know how to handle equipment. And they can make it do things which astonish people who see it done.

Take Over Job

For instance, a well-known pipeline contractor broke off excavation in a trench recently when a boulder 5 feet through stood in the way. Bill Deyoe was called in, with his Bucyrus-Erie 22-B hoe. He was soon on the job with the machine, and had the situation sized up. Before many minutes had passed, he'd dug a hole in front of the boulder big enough to get the 30-in. wide dipper under. Then, with the dipper lip under the rock, he walked the 22-B forward, using the whole weight of the machine as a lever. Grudgingly the boulder pried loose. When it was free, Deyoe grabbed it just right and soon had it out of there.

Then he continued excavating the trench, 14 feet deep, at a 50 foot-per-hour clip. The operator on the machine which had been replaced when they called Deyoe couldn't believe it.

Young and Deyoe are becoming leaders in the Arizona excavating business by sticking to one thing they know best—special types of digging which can be done with hoes. It includes the excavation of ponds and dams, commercial building footings, trenches, swimming pools and basements.

In the smaller excavating field,

(Left) **Excavation for this swimming pool was brutally rocky, but Bill Deyoe still preserved close-cut sides and bottom.** ***(Center)*** **Fuel, lube oil and oxy-acetylene equipment are always handy on this pickup truck parked next to giant cactus.**

they've introduced to Tucson the small hydraulic backhoe. Up to the time they moved in, digging with these small machines had been done only on a spotty, desultory basis. Now the use of these small machines has been clearly demonstrated, and other contractors are beginning to adopt the idea.

The 22-B hoe is the heaviest machine the partners use. Powered by a General Motors 3-71 diesel, it carries a ¾-yd. dipper. It has long since proved its ability to handle trench excavation to 19 feet deep, to dig rocky formations which stymied several other ¾-yd. hoes in the Tucson area, and to handle excavation which is impossible for wheel and ladder-type trenching machines.

They're happy in Arizona. Contractor Bud Young and Mrs. Young say Arizona is the place to live . . . especially when cold winters hit their former home in upstate New York.

Dig Caliche

The 22-B is used for excavating all the larger swimming pools, for pipeline contract work, and for sewer contracting. Jobs recently done with this rig included 4,400 feet of rocky trench excavation 8 to 12 feet deep, and 3,800 feet of 8 to 19-ft. deep trench digging through loose rock and caliche. The latter job had stopped cold a ¾-yd. machine which the prime contractor had depended upon. He found that it was cheaper to call in Deyoe on a rental basis.

Occasionally, the 22-B is used for other work, too. It has a crane boom, and can double in dragline work if necessary.

The partners also own and operate a smaller crawler mounted hoe—a Schield-Bantam. This ⅜-yd. size machine is used for smaller swimming pools, basements, and smaller trench jobs. Like the larger hoe, its dipper is operated with a three-part line, and it uses a ripping box on the dipper heel to break rocky formations loose ahead of the digging pass. This method of operation, carefully done, is easy on the machine, because it eliminates the necessity for crashing the dipper straight down. Deyoe pointed out, though, that it's much better to hoe straight down, in rocky material, than from an angle. Angle bouncing is a sure way to break teeth, adapters, and perhaps do more expensive damage to the boom.

The Schield-Bantam can get

(Right) **Huge boulders ripped out of the trench are shoved off to a waste area by one of a prime contractor's Cats.**

M. W. Deason *(left)*, who heads a swimming pool construction service, looks over a neatly dug pool with Bill Deyoe.

Deyoe's Traveling Hoe

BILL Deyoe and his hoe are like a boy and his dog," Bud Young said with grin. "It's safe to talk about Deyoe's wife or his politics, but you'd better not ever say anything about his hoe!"

Now it could be that Young's bantering remark overstates the tolerance his partner has toward discussing things close to his heart. But the remark about not saying anything against Deyoe's 22-B isn't overstated. If there's one thing close to Deyoe's affection, it's his machine.

For six years now it's served him well. It dug some of the toughest jobs in his area in New York, and it's handled work in Arizona which other machines couldn't touch. It was worth a $2,400 freight bill to Deyoe to ship the machine out to the southwest with other things he needed.

The rig shows none of the usual signs of obsolescence or wear. Deyoe sees to that. It's cleaned regularly, lubricated right, and isn't abused even in some of the hardest digging in Arizona. Fuel economy is an excellent two gallons an hour. There may come a day when Deyoe will think about trading in on a new machine, but the way he's serving his rig and getting service in return, it's a long way off.

through 8-ft. gates, can maneuver into extremely tight places, and still do a good job of digging in hard materials.

Two Davis backhoes also are on the equipment list. One is mounted on a Ford Major diesel; the other on a Massey-Harris tractor. Since these machines were introduced two years ago to the excavation of commercial building footings, Young and Deyoe have commanded practically all such work in the Tucson area. Their reputation for specialty work in this field is so clearly established that much business comes to them without any particular effort or hard sell on their part.

Good Reputation

What has helped also is their attitude. Both men are good craftsmen. Both take pride in their work. When they make a commitment, they meet it. It's resulted in a type of dependability which owners and contractors appreciate, so it's brought in much repeat business.

"We were a little taken aback when we found, under Arizona contracting licensing procedure, that we were limited to the excavating business," said Bud Young. "But it's a good thing. It's tended to protect our business. If we had to be swimming pool contractors, I'm sure six of our competing contractors wouldn't be giving us their work, as they do now. And if we had to be sewer contractors,

(Below) Here's the type of ranch home springing up in tracts outside Tucson, which the firm serves by constructing water and sewer lines, and swimming pools.

I'm sure we wouldn't be getting so much excavating business from those people."

Young and Deyoe both started in the construction business with only one thing to offer—a love for machinery. They've parlayed this into a going business which now shows every promise for the future.

Bud Young graduated from high school in a small New York town. Casting about for some satisfying way to make a living, he bought a small used bulldozer, and began digging basements and doing other small excavations. Soon he added a used truck to his operation. During the early years of World War II, he took on some U. S. Army work near Schenectady; he switched to working on the base when it was built.

Under Corps of Engineers supervision, about 36 cranes were eventually employed at this base. Young's mind and heart have always been with machinery, and the new cranes appealed to him. It wasn't long before he had a job as oiler. Then, because his operator was willing, he learned to run the machine. In three months he was a part-time operator, and in six months his status was full-fledged.

Young had a Navy hitch, attended Navy diesel schools where he learned General Motors diesels up, down and backwards. He wound up as a chief motor machinist . . . with experience and knowhow which is invaluable today.

(Above) **This type of heavy digging is typical, rather than exceptional, of Young and Deyoe's work. This ditch has just been completed for a clay-pipe sewer.**

Reaching a long way down, a Schield-Bantam hoe begins construction of a lateral line.

Back at the Army base after the war, he served as a universal crane operator, interchanging on 36 machines. It was there that he became acquainted with Bill Deyoe. Finally the inevitable day arrived when both men realized they faced dead-end civil-service jobs as crane operators all their lives. New fields beckoned.

Bill Deyoe had sold his home; had $1,200 in cash. Young had his experience and a driving willingness to make a business succeed. The two men pooled this, bought a small dozer and went into business. Because there wasn't enough work to keep two men busy, Deyoe stayed on at the Army base for a year. Finally the two men owned three dozers. Later on, Young bought Deyoe's interest; started in business for himself.

Enjoy Climate

It was the New York winters which finally caused both men to move to Arizona. Young came first, after nearly going to Pakistan for the United Nations to do some work there. By the time he decided not to go, winter was upon him. With his family, he came to Tucson, and soon had a job as excavating superintendent for Tucson Paving Co. Later on, before starting his own business anew, he worked for James Stewart Co.

By February 1958, he was well established with the Schield-Bantam, a tractor-mounted hoe and some trucks. He got in touch with his old partner, Deyoe, who came out to Tucson and decided he liked it. The rest is the story of a partnership. Deyoe shipped his 22-B to Arizona at a freight cost to the company of $2,400, and pitched in to help make a going business.

Operating capital still is tight, and expansion sometimes is slower than either Young or Deyoe would like. But the firm is growing and progressing nicely, and the Tucson area picture for future business looks bright. The partners now are beginning to move into the direct contracting field, placing their own bids occasionally.

Each man runs a machine; often runs a job. There is little overhead. Both men can service or repair a rig, if necessary. Both men make themselves directly responsible to their clients for dependable work. And as the months go by, more and more jobs come their way.

Young and Deyoe have definitely refuted what many a defeatist believes about entering the contracting business. In fact, they've shown that if you're just starting with a willingness to do good work, adhere to schedules, and get production in the tough places, that business will come more or less automatically. Even their competitors are on their side.

ONLY LOADER WITH 5-WAY

Allis-Chalmers tractor loaders offer extended service life, far less down-time by thoroughly cleaning all air and filtering all hydraulic oil.

Unmatched filtering protection—that's what you get in all Allis-Chalmers tractor loader models.

Air is double filtered by:

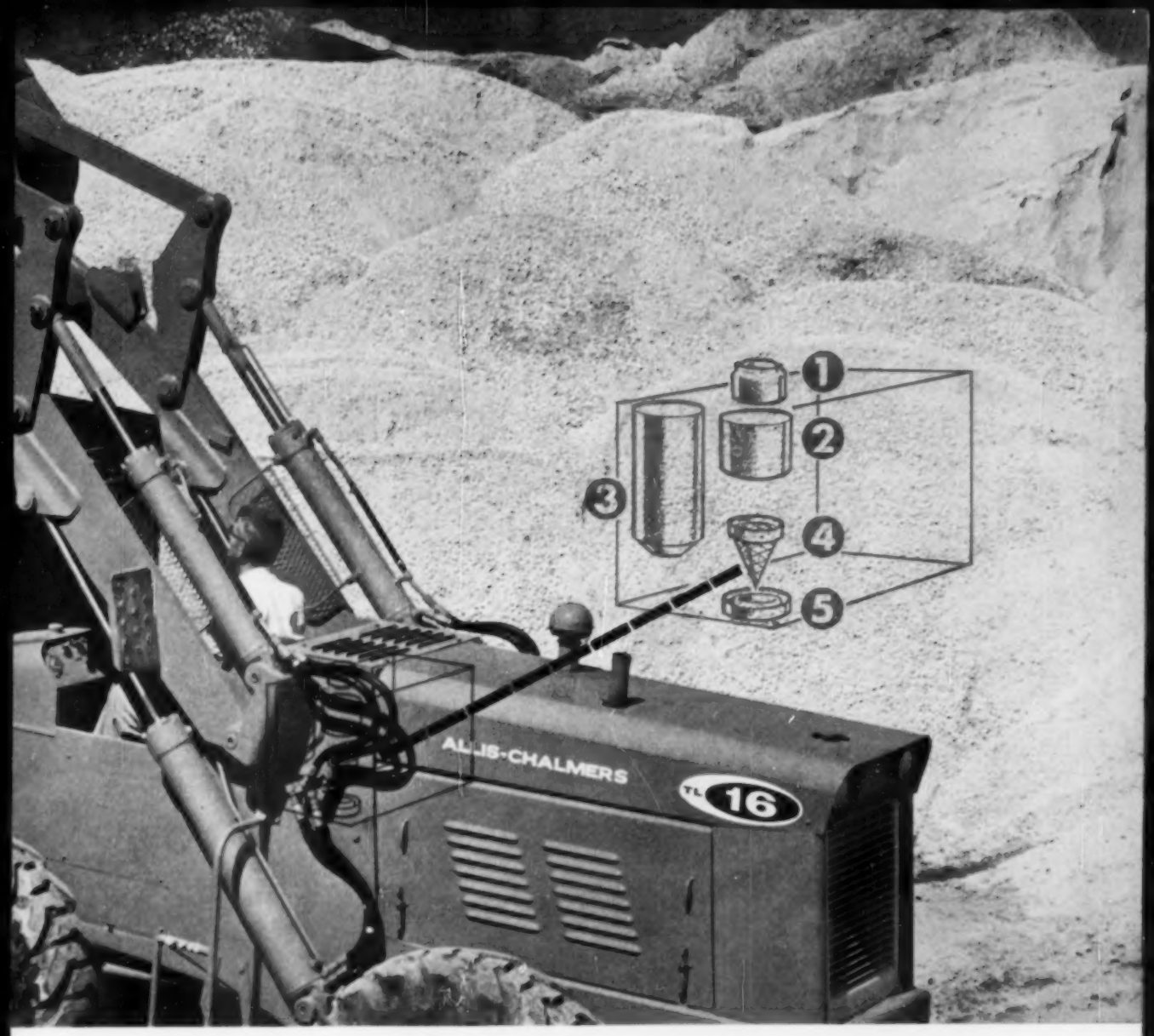
1. air breather
2. air filter

Hydraulic oil is cleaned by:

3. full-flow micronic filter
4. conical screen
5. magnetic filter

This 5-way filtering protection brings peak hydraulic operating efficiency . . . extended service life.

move ahead with



HYDRAULIC PROTECTION

Complete filtering protection is just another way Allis-Chalmers tractor loaders set the pace in the loader field. They also feature: *pin-connected axles* that eliminate shifting and rolling under load; *exclusive single-lever control* of all speed and direction; *safe, well-located dump cylinders* that are up and away from dirt; *extra reach* for easier dumping and *added stability* for moving big loads without tipping or spilling.

Your Allis-Chalmers dealer can give you facts on all 5 tractor loader models—ranging in capacity from 1 to 5 cu yd, in power from 76.5 to 130 horsepower. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

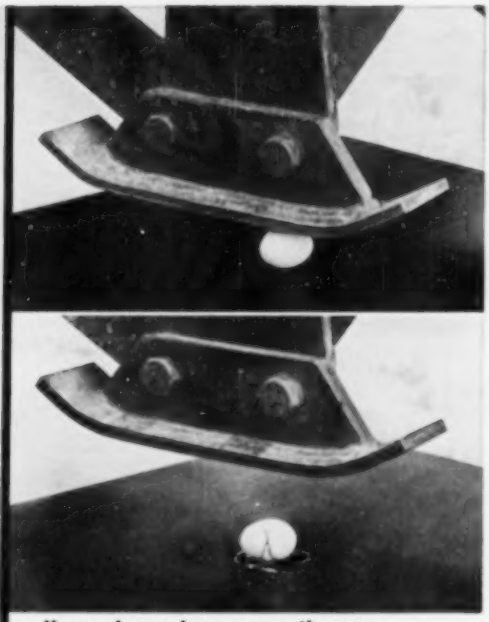
... power for a growing world

SO GENTLE–

you can just crack an egg

The oil-smooth control of the Hydrocrane® hydraulic crane gives you unbelievable precision and accuracy handling light or heavy loads. That's because there are no clutches to slip, no brakes to grab, no sudden, jerky control movements. Yet you're talking about a husky crane that handles loads up to 24,000 lb.

...most respected name in the field



Heavy, heavy hangs over the egg

Two tons of steel ease down and just touch this uncooked egg. Gradually, the pressure increases — as slowly as the operator moves his hand. Hairline cracks creep across the shell, then broaden until the thin inner membrane ruptures. Hold it. Back off. There it is — just cracked but still intact. This demonstration of Hydrocrane's unusual precision speaks for itself.

SO PRECISE–

you can spot loads on a dime

The Hydrocrane boom telescopes with the same smooth hydraulic action. It telescopes on the move, too. You don't have to stop to pull pins or add sections. You can make your pick in close, then ease the load into position even under low overhead structures. Yet you're talking about a crane that can reach up to 70 ft high with a jib.

SO COMPACT–

you can work without elbow room

Precision control and telescoping boom lets you work in narrow alleys and other cramped areas. You can install transformers without danger of chipping adjacent structures. With interchangeable hoe, you can excavate in developed areas where existing pipe and conduit call for the type of control that only Hydrocrane can give.

Let your Bucyrus-Erie distributor arrange a demonstration. See for yourself why the Hydrocrane is in a class by itself for your tough installation jobs. Call him or write for full details from Bucyrus-Erie Company, South Milwaukee, Wis.

8H60

BUCYRUS ERIE®

Ask the man who runs the rig...

no one makes a tougher tooth than ESCO

The right design, the right steel, the right shape make *ESCO* Points and Adapters right for every digging condition.

The earth moving industry looks to

ESCO®

Electric Steel Foundry Co., PORTLAND, OREGON

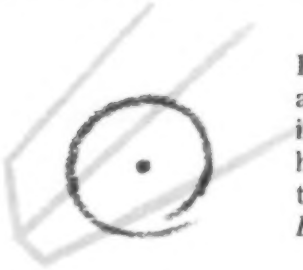
See reverse for shapes and size range

Here are the points to remember...

12M ALLOY STEEL

ESCO 12M Points are the toughest you can buy. Developed through years of research for the construction industry, cast *ESCO* 12M is carefully heat treated to produce the finest steel made for the severe shock and abrasion encountered by points and adapters.

RIGID QUALITY CONTROL TESTS ASSURE TOUGHNESS, HARDNESS



Every *ESCO* Point is Brinell tested to assure the exact degree of shock-absorbing toughness and abrasion-resisting hardness for longer digging life. Be sure to look for the Brinell mark on every *ESCO* Point you buy.

8 POINT SHAPES

You can select from eight different shapes to find the point that matches your digging conditions. *ESCO* Points are designed by bucket and excavation specialists who know how to achieve top digging performance. The self sharpening design of an *ESCO* Point makes it start sharp and stay sharp.

ESCO Points and Adapters for all digging equipment

Your local ESCO dealer can supply Points and Adapters for all your digging needs. By using ESCO Points and Adapters on all your equipment you can cut costs further by reducing your point inventory and consolidating purchases. Call your ESCO dealer today for details. He's listed in the yellow pages of your telephone directory. Or, write direct.

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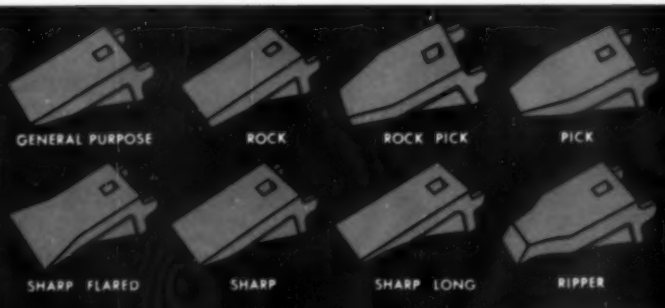
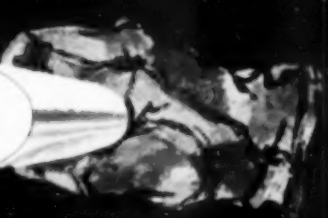


ESCO Point shapes start sharp, stay sharp and last longer under any digging condition.

ESCO



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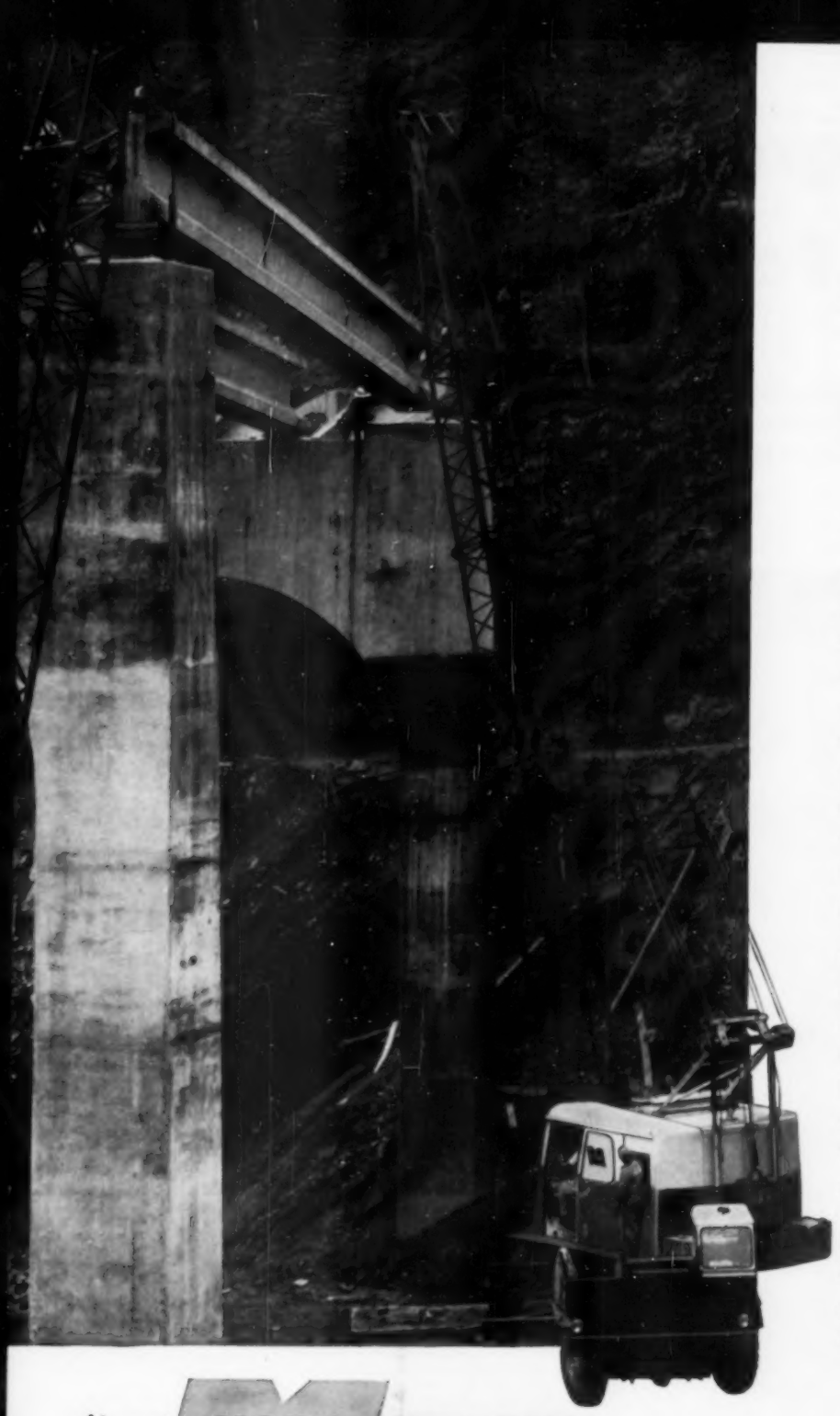


BENT MOUNTAIN BRIDGE WORK

Famed Skyline Drive in Virginia is getting a new look these days as a 40-ton, 43-M truck crane helps erect spans for an overpass situated 1900 ft. up the side of Bent Mountain near Roanoke. Using positive-acting Marionair control, these 35-ton prestressed beams are quickly hoisted in place with pinpoint accuracy.

Because of the steep switchbacks and narrow, short turns, the trucks which hauled the concrete beams had to be lifted around some of the curves. The Marion handled the job easily... without outriggers.

More proof that Marion cranes are the machines for you? Your nearest Marion distributor has it.

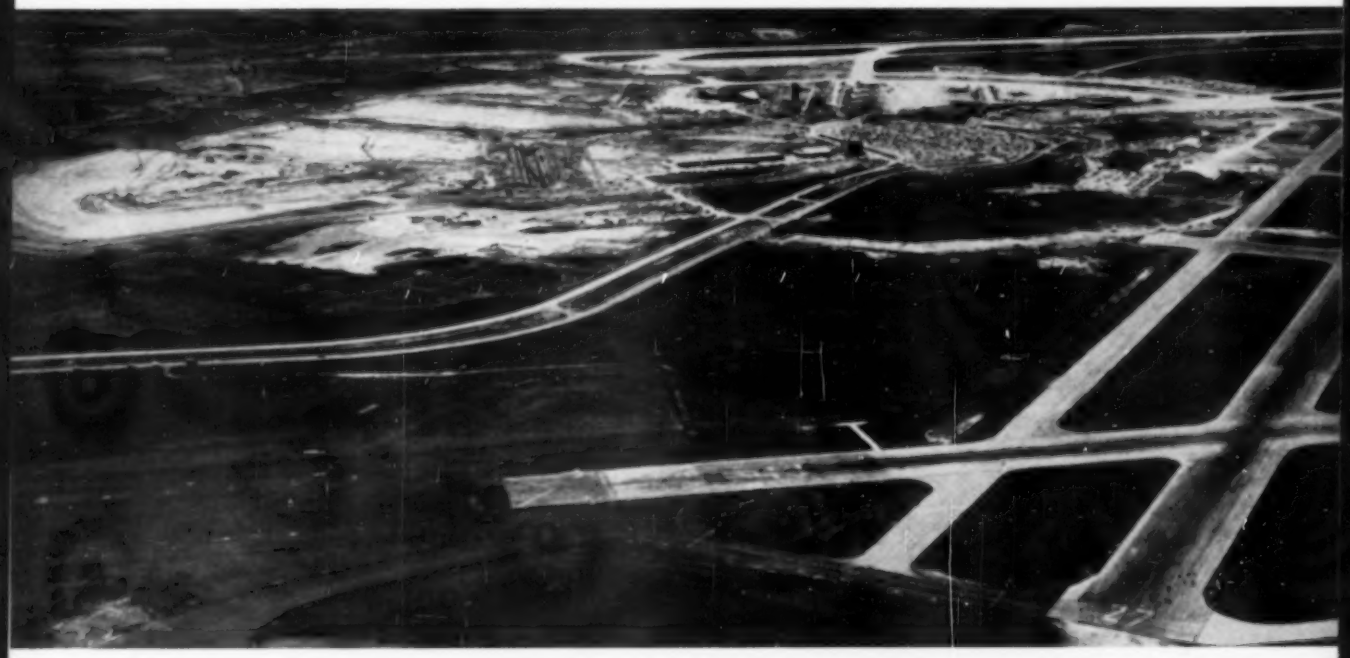
You get **MORE** *with* **MARION**

Marion Power Shovel Company, Marion, Ohio

A Division of Universal Marion Corporation

Rush Program Readies O'Hare For Jet Age

Despite increasing air traffic, soil problems and ground water, first-stage construction will be completed by early 1962. Main runway is being extended from 8,838 to 11,600 feet.



The scene above will be transformed into the ultramodern airport below at a cost of $120 million. O'Hare now has the country's longest runway in use by commercial aircraft. At present 22 contractors are handling contracts which total $71 million.

THE jet age has rushed into Chicago's big O'Hare International Airport where air traffic volume is breaking the best estimates of airport planning consultants. To meet the urgent needs of jet aircraft, the Windy City is expanding the muncipally owned field in a four-stage, $120 million construction program. The existing unimpressive terminal and hangar area will be transformed into what planners call the world's largest and most modern airport.

At present 22 contractors are on the job handling contracts which total $71 million. Most active is S. J. Groves & Sons Co., Minneapolis, Minn., with $12½ million worth of earthmoving and paving work. Groves moved in $6½ million worth of equipment to handle more than 8 million yards of dirt—most of this equipment spread came from the recently abandoned Richard I. Bong Air Force Base site at Kansasville, Wis.

At O'Hare during recent months, two 10-hour shifts a day, seven days a week were worked by 160 operators to meet a July 15 completion date for extension of the main north-south runway 14R-32L from 8,838 to 11,600 feet. The extended runway has now become the country's longest in use by commercial aircraft.

O'Hare had its beginning in the early 1940's when several civic organizations initiated airport planning studies to build a new suburban field. The site approved by these groups became known as Douglas airport when runways were constructed by the federal government during World War II in connection with a nearby aircraft factory of Douglas Aircraft Corp. Plans to develop the site as a civil airport picked up speed in 1946, when the War Assets Corporation declared Douglas airport surplus, and gave Chicago a quit-claim deed to 1,080 acres.

Land Annexed

More land was acquired and numerous improvements were completed prior to March 1956, when Chicago annexed O'Hare and a strip of highway connecting it with the city proper. The Northwest expressway now connects O'Hare to the expressway system serving the metropolitan area. Airline traffic is expected to reach the five million passenger mark (originally predicted for 1965) this year.

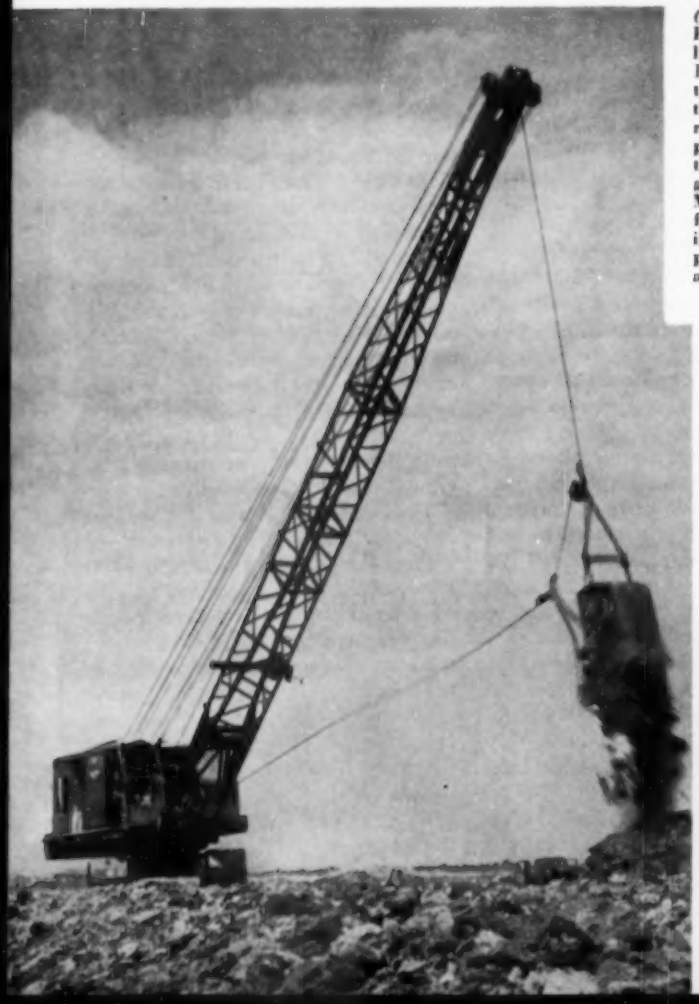
Because of the space needed for big jets, further changes were seen necessary and in March 1957, the city appointed the architectural-engineering firm of Naess & Murphy to review O'Hare development plans. A basic four-stage plan was agreed upon in March 1958, and in the fall of that year construction began.

The airlines are doing a remarkable job of handling the huge traffic volume because only 29 gate positions are now in use. There will be 85 positions available in the new terminals. Right now, handling 16,000 passengers per day is quite common. In fact, more than 21,000 persons emplaned or debarked at O'Hare on June 26.

Bill Chandler, project superintendent for earthmoving contractor S. J. Groves, says the heavy airport traffic created their biggest problem during construction of the runway extension. An unusual amount of coordination between contractor and supervising agencies was necessary in timing of earthmoving, laying of base courses and paving concrete—all while runways were kept open.

Take-offs of the big four-engine jets created special problems. One close-up back-blast could have ruined several days work in a few seconds. Fine graded material and survey stakes sometimes were blown away, and smoke and dust threatened to throttle workmen.

To prevent this, the main runway had a threshold marker 800 feet off



(Left) **A Bucyrus-Erie 38-B dragline mounds up 1½-yd. loads of tough blue clay in the 100-acre borrow pit. When properly aerated, the clay makes good fill.** ***(Below)*** **Material too wet for use is pushed into position for pickup scraper by a TD-25.**

(Right) Another 24 yds. of dirt are hauled out as Cat D-9 gives assist to twin-engine Euclid TS-24 scraper. *(Left)* Precise compaction control is assured through the use of new test apparatus. Soiltest, Inc. used a compact nuclear device on runway extension work. *(Below)* Business as usual as one of United's jets takes off near work area.

the south end of the runway to hold back jets from approaching the construction area.

To solve the problem of crossing the busy runway, Groves' trucks were equipped with two-way radios to maintain contact with the control tower. Guards were posted on roads leading into the field and special windshield tags were issued to vehicles which required entrance into critical areas. For crossing of the main runway, vehicles were equipped with orange and white checkerboard flags.

These safety measures were proved necessary for, before they went into effect, (according to a recent *Reader's Digest* anecdote) a woman driver seeking O'Hare terminal drove onto the field and momentarily halted all operations. As the story goes, she turned into an asphalt drive from the northern boundary of the field (Higgins Road) and then proceeding to her destination, came upon a broad strip of concrete pavement which she assumed was a first-class highway leading to the terminal.

Amazed controllers in the tower did a double-take that day as they unbelievingly watched a passenger car speed down the center of the main runway into the face of aircraft awaiting take-off signal at the end of the runway. The little lady was right, of course, for her "highway" did lead to the O'Hare terminal. It was not, however, the route advised by airport officials.

Rain Slows Digging

Poor weather earlier this year hampered all operations seriously. Walter Metschke, director of engineering for Naess & Murphy, said that the only really dry weeks all spring were the two in the early part of June. On the RB-7 contract calling for extension of the main runway, a time extension had to be put on the contract by the city. According to the original progress schedule, the extension was to have been completed last fall but wet weather coupled with an early freeze prevented any earthmoving progress until late spring. The new completion date for the extension was set at Aug. 31, 1960 with the imposition of liquidating damages of $1,500 per day beyond that date.

The weather has been rough construction wise but, according to Metschke, the most sensitive factor on the runway job and other areas of the project is soil conditions. The soil problems encountered called for a huge amount of auxiliary equipment. Borrow material is a tough problem because soils are wet in the borrow pits. To bring it down to the proper moisture content for compaction purposes, the contractor must aerate it. This means that a relatively high number of rollers and discs are necessary. For borrow hauling, Groves had a total of 42 scrapers and bottom-dumps on the job.

Clay that is excessively wet must be wasted. Pockets of sandy soil, 12 to 15 feet deep also must be mucked out and replaced with suitable material at optimum moisture. Added to this, the big 7,000-acre site (10 square miles) is plagued by perched water tables. These are pockets of water trapped under the surface by impervious clay or rock. These water tables must also be cleaned out and backfilled with good material.

About 75% of the earthmoving on the job is handling unsuitable material that must be wasted or wet suitable material that must be moved, aerated and compacted. Areas where pavement will go must be undercut until material is reached which will not deflect under the weight of a 50-ton roller. This process of testing the ground is called proof-rolling.

However, there is a lot of good soil provided it is handled right. One of the first things the engineers did when they arrived on the job was to grid the area, taking subsurface borings to test soil bearing values. From these samples, the engineers were able to produce a contour map showing depth of all underground material that was above proper moisture content and had to be removed. An overall grading plan was worked out for the site which provided millions of yards of suitable borrow. Borrow pits are all

on the site and no material need be brought in.

R. D. Barnes, project engineer for Groves, said that about 95% of the fill material used at O'Hare comes from two main borrow pits—the rest from normal field grading operations. The pits are located near Lawrence Ave., one of which is a 100-acre pond which will act as a future reservoir for catching storm waters. The fill material dug from the pits is a blend of brown and blue clay. This blue clay is tough to work with, but makes excellent fill material if it is handled right. The optimum moisture content for compaction is 14%. As the material lies in the pit, it often runs to a moisture content of 24%. This means the material must be thoroughly aerated when placed in the embankments. When the clay is properly disked and exposed to the drying action of the sun and wind, it becomes very hard—"like concrete," one of the engineers said.

Rejected material is being put to good use at O'Hare. It is hauled to a low swamp area of about 200 acres located at the southwest corner of the field. The spoil material going into this area includes both waste top soil and material from undercut excavation. Eventually this swamp area will be a useful level portion of the field.

Groves had seven Euclid TS-24 twin engine scrapers working in the swamp area. Two 1½-yd. Bucyrus-Erie 38-B draglines worked the muck areas and during later paving work were used to charge the batch plant.

The 100-acre retention pond on the site will be capable of handling 100-year storms, that is, storms of the worst intensity ever recorded in a 100-year period. For instance, several years ago the Chicago area received 6 inches of rain within a 12-hour period. Should this re-occur, the retention pond would handle the airport's runoff water without overloading local storm sewers. Inverts bringing drainage water from the field come out below the water surface on the pond. The flow in these inverts, however, will have sufficient velocity to easily discharge into the reservoir. Handling the drainage will be two large 96-in. drains and a 72-in. drain. There will also be a 10x18-ft. arch section poured monolithic structure to drain into the pond.

Grading Contracts

Earthmoving contracts run as follows. Contract RB-1 (Arcole Midwest) 1⅓ million yards; RB-3 (Consolidated) 900,000 yards; RB-7 (Groves) 1½ million yards; RB-20 (Groves) 4½ million yards; and RB-24 (Kamen and Groves) 60,000 yards for underground utilities. The big bulk of earthmoving now remaining consists of site-grading at the entrance to the airport on Mannheim Road, the cargo area, parking lots, aprons and various interchanges.

Arcole Midwest performed a small

Granular sub-base is laid with a Jersey-type spreader in two 6-in. lifts, 12 feet wide. The material reached 98% density after one pass with vibratory compactors.

$6½ Million Spread

Here is the major equipment used by S. J. Groves.

- 1—Allis-Chalmers model 360 20-yd. scraper
- 5—Caterpillar DW21 scrapers
- 6—Caterpillar DW20 bottom-dumps
- 6—International 295 Payscrapers
- 2—LeTourneau-Westinghouse model D 10-yd. scrapers
- 16—Caterpillar portable light plants
- 16—centrifugal-type pumps ranging in diameter from 3 to 10 inches (including Jaeger, Gorman-Rupp and Homelite)
- 1—Euclid TC-12 twin-engine dozer
- 6—Caterpillar D9's
- 22—Caterpillar D8's
- 3—Allis-Chalmers HD-21's
- 4—Caterpillar Traxcavators No. 933 and 755
- 2—Bucyrus-Erie 38-B 1½-yd. draglines and cranes
- 1—Northwest 80-D 2½-yd. backhoe
- 1—Bucyrus-Erie 22-B Transit Crane
- 2—Austin-Western hydraulic cranes
- 1—Northwest 95 crane-clamshell
- 11—Caterpillar No. 12 graders
- 1—Essick vibrating roller
- 2—Vibro tampers
- 3—Bros rollers
- 10—LeTourneau sheepsfoot rollers
- 1—Ferguson self-mobile compactor
- 2—Ferguson sheepsfoot rollers
- 5—Welding machines
- 3—Convoy Luber lubrication trucks
- 1—Galion gas-powered three-wheel compactor
- 1—Buffalo-Springfield three-wheel compactor
- 1—Jersey spreader
- 1—Robbinson spreader
- 7—Euclid 7FDT trucks and 28TDT dump trucks
- 10—Euclid TS-24 twin-engine scrapers
- 6—Rome disc rollers
- 8—Vans and trailers
- 22—pickup trucks
- 5—passenger cars

amount of site grading at the northern end of the field and subbed the remaining portion to Groves. Groves also graded all the hangar areas where presently buildings are under construction. According to the supervising authority, Naess & Murphy, Groves is an efficient contractor for the job. The firm has employees with experience and, most important, moved in plenty of equipment.

Typical of the entire O'Hare operation, the laying of base courses was carried through with speed and efficiency under rigid specifications. The granular sub-base course called for consists of coarse aggregates (retained on No. 4 sieve) and fines (passing No. 4) compacted through full depth to 97% maximum density at optimum moisture. Aggregates called for were processed gravel, crushed stone or air-cooled, blast furnace slag. The sub-base was laid in two 6-in. thick lifts, 12 feet wide using Jersey-type spreaders. Jackson vibratory compactors followed the spreader, working the material to 98% density in one pass. After both lifts were set, the base course was further compacted with an Essick vibratory tamper.

The subgrade under the granular base material previously had been compacted to 95% modified proctor density. No chances were taken in preparing the subgrade and laying granular base course, and three testing firms acted as subcontractors to Naess & Murphy to make sure all contractor operations met the specifications.

One of the unusual testing setups was handled by Soiltest, Inc., Chicago, Ill. The testing firm used nuclear test apparatus for compaction control on the runway extension. By using a nuclear surface moisture probe and nuclear surface density probe, precise measurements were taken on the job without using mathematical calculations and without disturbing the material undergoing tests.

The other two testing firms on the job were Testing Services of Chicago, in charge of concrete and metals testing, and Walter H. Flood, for asphalt and base course testing.

One of the most unusual aspects of the huge construction program at O'Hare Field is the installation of underground ducts and manholes. This is a rush priority job being done under several contracts. The "crash program" is necessary to complete the underground work on time to fit in with grading and paving schedules for the taxiways and aprons. The utilities are being installed on 21, 30, 45 and 60-day priorities.

Duct System Complex

According to Harry Kagamaster, chief electrical engineer for Naess & Murphy, O'Hare will have the most complex concentration of ducts in the country. The underground network of 3 and 4-in. asbestos pipe will stretch out over one million lineal feet, or 311 miles. According to Kagamaster, the complexity of the system is approached only at Bunker Hill Air Force Base which is a B-52 bomber base in Indiana.

A large portion of the complex installation is being handled under a $2 million contract (RB-24) held by a joint venture of Kamen Utilities Co. and S. J. Groves. The contract calls for installation of banks of ducts along the perimeter of the outer circular taxiway. The ducts are placed at a 50-ft. nominal distance outside of the taxiway and are encased in concrete designed to take a wheel impact load of 100,000 pounds.

This high impact resistance is required even though the ducts are a considerable distance off the runway because the planes occasionally skid off the runway onto the turf. If this does happen, Kagamaster said, the ducts and manholes won't be any plane's deathtrap. The ducts are back-

(Above) **A 2½-yd. Northwest 80-D hoe is used to gouge out space for manhole installation.** ***(Below)*** **A new model Allis-Chalmers TS-360 hydraulic scraper takes out top portion of ditch for duct installation. The 30-yd. capacity rig helped trench excavation move along at a rate of 2,000 yards per day.**

(Above) **Traxcavator followed hoe to finegrade the floor and cut square corners on excavation for manholes.**

filled with a dirt cover varying from two to eight feet.

To speed excavation of the ditch for the duct banks, the contractor used scrapers to dig a cut to a width of 13 feet and a depth of six feet. The trench excavation moved along at the rate of 2,000 yards per day. Groves used an Allis-Chalmers TS-360 hydraulic scraper of 30-yd. heaped capacity to take out the top portion of the ditch. The scraper was pushloaded by a Caterpillar D8 tractor. Also used to some extent were small LeTourneau Carryall scrapers of a 6-yd. capacity.

There will be a total of 70 manholes required in the duct system. At points where manholes are required, a Northwest model 80-D 2½-yd. hoe dug the excavation deeper. Traxcavators were used to finegrade the floor, and to cut square corners on the excavation. Each concrete manhole structure needs three to four tons of reinforcing steel. Kagamaster pointed out that one manhole on the project has five covers—it's that big.

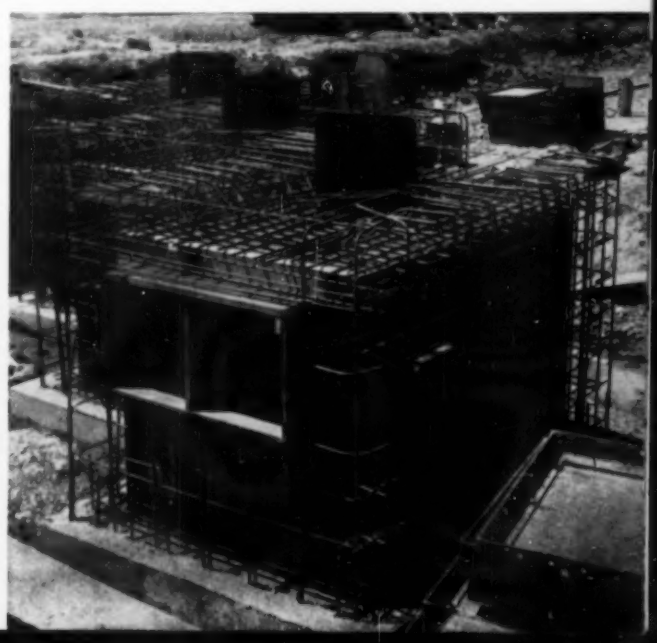
On contract RB-24 alone, approximately 30,000 to 35,000 yards of casement concrete will be required in the duct banks. The banks are placed on a 3-in. deep concrete footing approximately 12 feet wide. Along the taxiway there are three banks of 32, 24 and 20 ducts.

The personnel list for S. J. Groves & Sons Co. includes William Chandler, project superintendent; R. D. Barnes, project engineer; J. F. Healy, paving superintendent; Harry Knisely, grading superintendent; and Orren Hotvedt, master mechanic. Groves' main office is in Minneapolis and the firm has regional offices in New York City, Highland Park, Mich., and Springfield, Ill. At present, the O'Hare Field job is Groves' biggest.

Naess & Murphy has 80 people on the site under the direction of Walter Metschke, director of engineering. Ed Plawin is chief construction engineer and Harry Kagamaster is the chief electrical engineer. Administrative engineer for the active firm is John Kunis.

Airfield work is getting to be almost routine for Naess & Murphy. The firm prepared the design for the $75 million Bunker Hill air base at Peru, Ind., and Bell air base at Hamilton, Burmuda. Presently, Naess & Murphy is engaged in approximately $300 million worth of construction in the Chicago area alone.

(Below) **Complex system of ducts will carry utilities underground for a total of 311 miles. Concrete casing is designed to take an impact of 100,000 pounds.** *(Right)* **Three of the 70 manholes required in the duct system. Each concrete structure needs three to four tons of reinforcing steel.**



O'Hare's Concrete—Thick and Smooth

Nation's longest commercial runway is now in operation at Chicago's O'Hare Field. The 11,600-ft. long, 200-ft. wide super runway is designed to support 195,000-lb. loaded jets.

WHAT makes one airport superior to another? A good answer to this question can be found at Chicago's O'Hare International Airport. Only don't go to the terminal area. Instead, wander over to the south end of the big 7,000-acre site to a little abandoned brick school house on Irving Park Road. Here you will find the field offices of Naess & Murphy, consulting engineers representing the city of Chicago. Ask for Walter Metschke. He is the director of engineering and can tell you everything about every phase of the massive $120 million construction project.

Metschke is justly proud of the job being done at O'Hare, for the end product of what now appears to be a tangle of men and equipment, noise and confusion will soon become the world's largest and most modern airport. First stage of the four-stage project was started in the fall of 1958 and is scheduled for completion in early spring, 1962.

To answer the question of what makes O'Hare a superior airport, Metschke says, "the total improvement program includes buildings, concourses, fuel storage system, parking facilities, utilities and, in general, every public service an airport can need. The field's ability to function as a world leader in the jet age, however, hinges on having pavement strong enough for present planes and bigger ones to come." There is the key—pavement, the foundation of the super airport.

Paving the 2,762-ft. extension to runway 14R-32L (RB-7) is one of the primary concerns of the whole O'Hare project. The challenge was met by, and the contract awarded to S. J. Groves & Sons Co., Minneapolis, Minn. This firm had what the job needed—men, experience and, most important, a big $6½ million equipment spread.

To pour the 15-in. thick concrete, Groves used four Koehring 34-E Twinbatch pavers simultaneously on each lane. As each of the four batches from a dump truck was emptied into the hopper of the paver, water was automatically introduced into the mixing drum from a tank truck stationed alongside the paver. The overall operation was a precise, well-timed sequence of delivery, mixing, pouring and finishing.

Each concrete strip was poured in 25-ft. widths so there were eight strips to make the overall 200-ft. width. The best record Groves obtained during the various pours was approximately 310 feet in one hour.

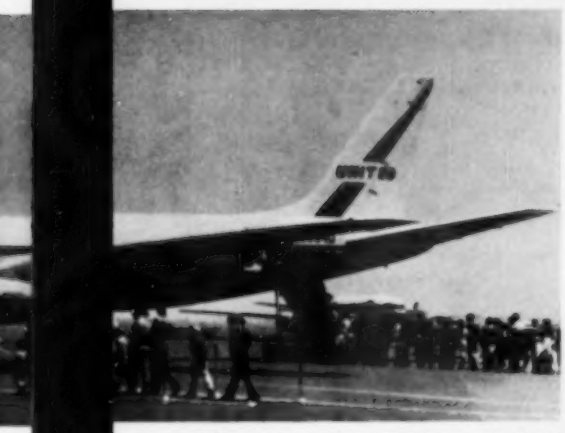
Daylight Paving Only

Each 2,762-ft. lane of the runway was paved in nine hours time. The crews were called out at six a.m. and paving operations were fully underway by seven. By 4:30 p.m. the entire lane was completed. No paving was done at night. During the paving operation, the main runway at O'Hare was closed to all traffic. The planes then used the 7,000-ft. long east-west runway.

The first runway lane was poured on July 8th, and the final strip on July 22. After the installation of runway lights, paving of shoulders, sealing joints and painting stripes, the 11,600-ft. runway was put into official operation on August 31, 1960. In the past, international flights to Europe from O'Hare had to make one stop for fuel before arriving at their destination. With the addition, the big ships will fly overseas nonstop.

The Portland cement concrete pavement for this extension was designed to these criteria: (1) smoother runways to increase high-speed jet safety on take-offs and landings; (2) reduced maintenance through controlled cracking; and (3) 100,000-lb. single wheel load at lowest possible cost. It was decided to halve the number of joints by pouring 50-ft. slabs rather than the usual 25-ft. slab.

To help control the cracking of concrete during temperature changes, a 6 x 12-in. welded wire fabric (00 No. 3) was placed in the 15-in. concrete



(Above) Giant jets like United Airline's DC-8 Mainliner require longer and tougher runways. This beauty carries 105 passengers and 12,000 pounds of freight. *(Below)* Paving operation moves along at about 310 feet per hour. Crew works nine hours to pave each 2,762-ft. lane.

(Above) Concrete spews out of paver to form 15-in. deep runway slab capable of supporting a 100,000-lb. single wheel load. *(Below)* One of the four Koehring 34-E Twinbatch pavers in Groves' spread receives load from a four-compartment dump truck.

about four inches from the surface. Plastic strips were installed between the slabs. Test beam samples of concrete were taken periodically by the engineers who ran laboratory tests to determine flexual characteristics. Specifications required a 700-psi strength in 38 days.

The concrete was poured with a crown of 1¼% to shed rainwater. The water will drop off of the 2% asphalt shoulders and then onto turf which is sloped downward from the shoulders. A 4-ft. asphalt shoulder was installed on both sides of the runway.

At the end of the runway pavement, a blast pad was to be constructed to absorb the back blast of plane awaiting take-off. The pad consists of eight inches of granular subbase, eight inches of stabilized aggregate and a 2-in. topping of asphalt. The pad is

not intended for support of the huge planes, but is designed to withstand the weight if a ship should accidentally roll onto it.

The batch plant Groves used for the main runway and is currently using for concrete work on aprons and taxiways was shipped from Bong Air Force Base, in early spring this year. It is a four-stop automatic, electronically-controlled plant for trucks with four-divider compartments. Each Butler bin has a capacity of 150 tons of material. Each bin is fed by a Pioneer conveyor. The screening unit at the base of the conveyor automatically insures that material of the right size will be fed into the mix.

Precision Batching

Stockpiles, of course, are pregraded and the final screening process is insurance against any oversize or subsize material being mixed in. The four steps are as follows: First, course aggregates of nominal 2-in. size are added; then fine stone of nominal 1-in. size comes next; sand is the ingredient of the third stop; and finally cement is added. Coarse and fine stone are loaded into the screening hopper by a pair of Bucyrus-Erie 38-B clamshell cranes. One carries a 2½-yd. Owen bucket; the other a 2½-yd. Erie Strayer bucket. Sand is loaded by a front-end loader either a Hough Payloader or an Allis-Chalmers TL-20 Tracto Loader. All four stops are operated simultaneously by a single operator at the electronic central control panel.

Each truck driver must position his truck directly under the gate of the hopper so that the measured material will fall into the proper compartment. A wire feeler similar to a fender guard on an automobile tells the driver when he is in position when it touches a predetermined point in his truck. When he is in the proper position, the truck driver flashes on his headlights as a signal to the control panel operator, who then pushes the discharge button that actuates the air-operated gates on the hopper.

If the material in the hopper is exactly the quantity specified (as determined by the automatic beam scale), the contents of the bin then fall into the truck and the driver moves up until all compartments in the truck have received one charge of the first ingredient. Then he moves to the next stop and receives the next ingredient; and so on until the mix is complete.

The proportion of the concrete mix is carefully controlled by a set of beam scales at each batch station. The scale is pre-adjusted to exactly the right amount of material required. A set of green and red lights are mounted on each hopper to indicate green when the batch ingredients are to exact measurement and red if there is an overage or shortage. The central plant operator, by using an over-control, can add additional materials in minute quantities by depressing one of the push-button controls; however, if too much material has been added, the workman must remove the excess in the bin by hand. The beam scale required periodic checking to adjust for accuracy.

The batch plant has the additional feature of being able to produce two different batches automatically by switching from one weighing circuit to another. Thus, one mixture may be prepared for paving and another, for other purposes such as structures and foundations.

According to Lyle Thompson, chief civil superintendent for Naess & Murphy, the concrete plant has the biggest output capacity of any currently being used on an airport project in the United States. At the height of the paving operations, the plant turned out 300 batches per hour of 34-cu. ft. concrete mix with a 10% overload. The plant is capable of turning out over 700 batches per hour. A fleet of two dozen Ford and GMC four-compartment dump trucks hauled the batches to the runway pours.

Present stage one construction is to be completed in the fall of next year. The terminal area buildings, however, are to be completed in the spring of 1962. A later completion date is possible for the buildings because struc-

Continued on page 33

Contractors — O'Hare Field

NUMBER	CONTRACTOR	DESCRIPTION	AMOUNT
RB-1	Arcole Midwest Corp	Site grading	$ 1,905,614
RB-2	Malan Constr. Co.	American Air Lines maint. facilities	5,387,000
RB-3	Consolidated Constr. Co.	Paving, grading and utilities	3,882,577
RB-4	Corbetta Constr. Co.	Terminal building sub-structures	1,610,500
RB-5	Chicago Bridge & Iron Co.	Furnishing and installation of 16 fuel tanks	474,920
RB-6	Ryan, Inc.	Foundation for sixteen fuel tanks	88,570
RB-7	S. J. Groves & Sons Co.	Second extension to runway 14-R-32L and taxiway	4,427,292
RB-8	Santucci Constr. Co.	Water main and sanitary sewers	1,238,520
RB-9	Wm. E. Schweitzer & Co.	United Air Lines hangar and site work	4,645,000
RB-10	Malan Constr. Co.	General facilities tank farm	1,645,000
RB-11	Malan Constr. Co.	Eastern Air Lines hangar	3,794,000
RB-12	Frank S. Bellis	Furnishing and installation of four refrig. mach.	283,477
RB-13	The International Boiler Works Co.	High temperature water generators and expansion DROM	218,926
RB-14	Consolidated Constr. Co.	Terminal area, terminal building basements	818,690
RB-15	(Not let)	Delta Air Lines hangar	(Not let)
RB-16	Wm. E. Schweitzer & Co.	Concourse super-structure	11,097,000
RB-17	(Not let)	North Central Airlines maint. facilities	(Not let)
RB-18	Abbot Constr. Co.	Potable water and fire protect. systems East., Bran., N.W., Cap. A. L.	466,666
RB-19	(Not let)	TWA plans	(Not let)
RB-20	S. J. Groves & Sons Co.	Site grading-phase II and entrance road paving	5,986,734
RB-24	Kamen Utility Electric Corp. & S. J. Groves & Sons Co.	Underground electric manholes and ducts	2,289,338
RB-27	Santucci Constr. Co.	Utilities phase I	3,001,500
RB-28	Malan Const. Corp.	Terminal Area Terminal Buildings	18,366,000
		TOTAL	$71,577,326

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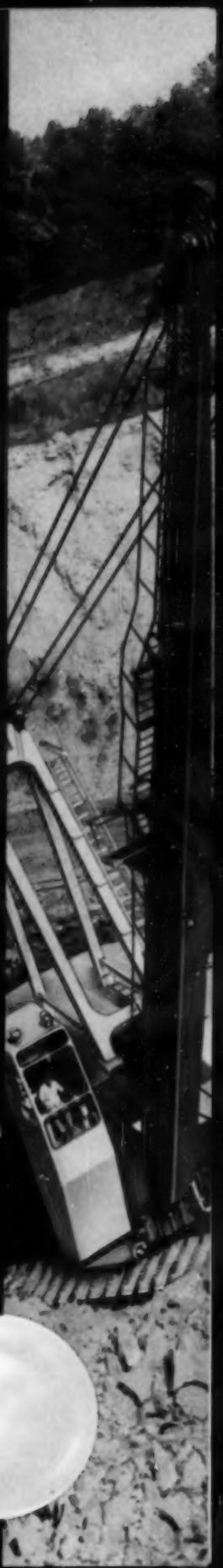
new

270-B



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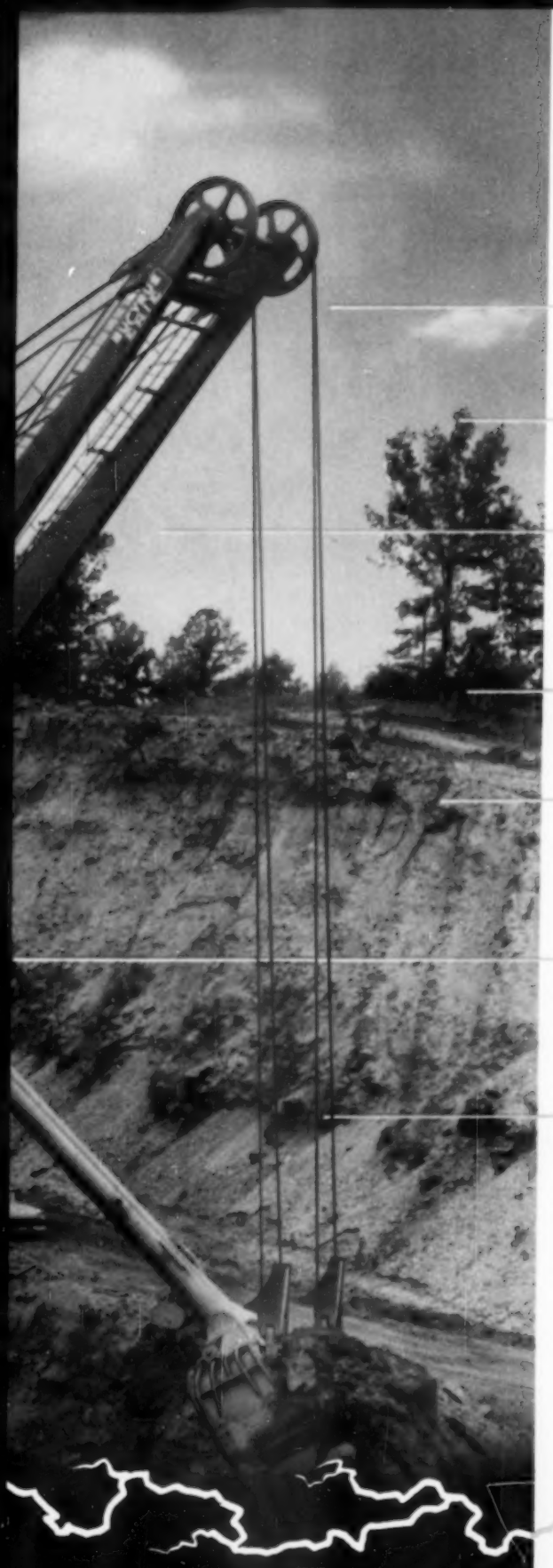

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Previous systems have been adaptations of existing control devices to excavator service. *This is the first system designed to obtain specific digging characteristics.*

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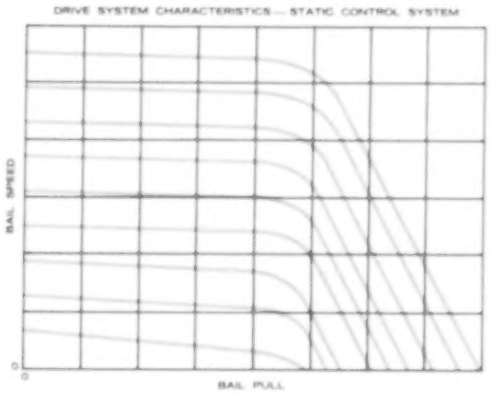

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O'Hare . . .

Continued from page 28

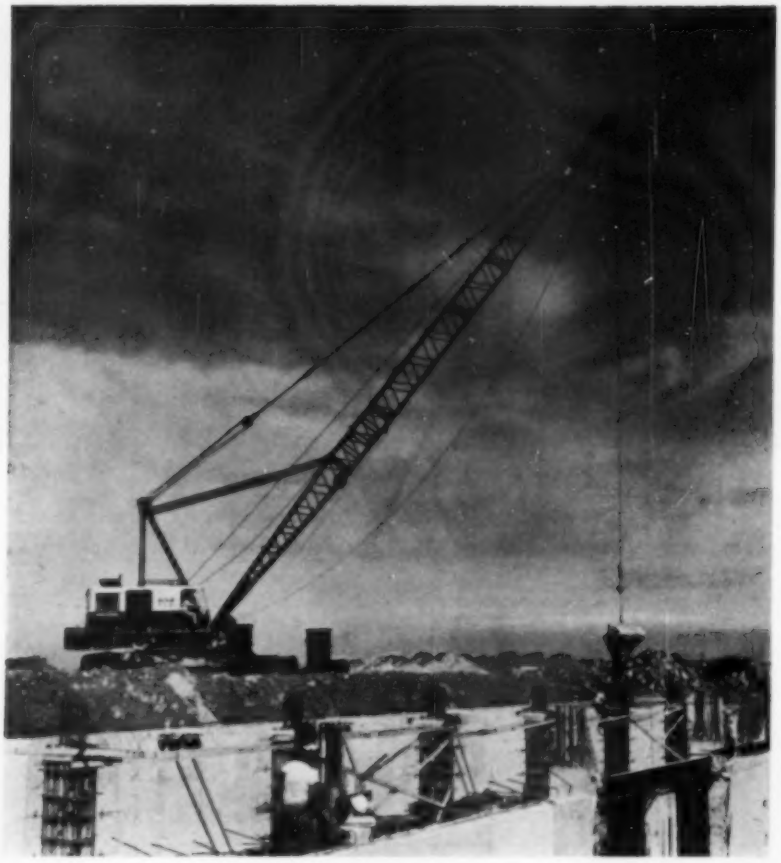
tural and concrete work may be continued throughout the winter. United Airlines' and American Airlines' interim facilities which cost more than $1 million will be torn down. The present terminal will remain and, after extensive remodeling, will serve as the international arrival terminal. It will get a complete new facade to blend in with the design of the new ultramodern structures.

Some of the buildings now under construction are being placed on piles. The additional support is necessary because of the silty sand zones in the area. If properly confined, these areas can carry a good load so sheet steel piling is being driven in some cases to shut off a bearing area.

An unusual feature of the concourse and terminal buildings is the use of about 25,000 yards of lightweight concrete. Some of the foundation and footing costs for the structures are being cut by the use of this type concrete. The terminal buildings will be roughly 800 by 130 feet. A typical floor section will have a 16-in. thick deck. To eliminate more of the dead-

Continued on next page

High-speed batching keeps the stockpile area machines constantly busy. Groves uses two 38-B clamshell cranes *(above)* and two front-end loaders to charge the plant. *(Left)* Hough Payloader scoops up sand behind Butler bins and conveyor. Allis-Chalmers TL-20 Tracto Loader also loads sand for plant.



pavement would push across the existing U. S. Highway 45 (Mannheim Road) so the highway would have to be relocated eastward. It is doubtful that this great length will be actually required since future jets are likely to provide more thrust and require less take-off space, engineers say.

Progressive Team

The O'Hare project is being built under direction of the city of Chicago's Public Works Department headed by Commissioner George L. DeMent, and the Department of Aviation headed by Director William E. Downes, Jr. The architectural and engineering firm of Naess & Murphy represents the city as design engineers and construction supervising engineers. Landrum & Brown are the airport consultants, and James P. O'Donnell is the fueling consultant. Twenty-two contractors round out the team that is now working to pave the way for aviation progress at O'Hare Field.

(Left) **A load of concrete is neatly placed by long reach of crane. Structural and terminal work will be completed in the spring of 1962.** ***(Below)*** **Although a good distance from Midway airport and the Loop, expressways make ground access to O'Hare easy.**

weight, the concrete is being poured in a waffle design around 1 x 2-ft. cardboard boxes. Walt Metschke says that one of the unsually designed buildings will be the tall cylindrical restaurant building.

A Rex batch plant has been erected on the site by Wm. E. Schweitzer & Co. The lightweight concrete mix used for buildings has a tricky slump which calls for quality control and short hauls. The chief reason for careful handling is the lightweight aggregate in the concrete. It is an expanded shale—called Materialite—made by Material Service Co., Chicago. The expanded shale is porous and absorbs water so fast that it must be handled as speedily as possible. O'Hare requirements for new buildings amount to one of the largest lightweight concrete jobs in the Chicago area and offsite mixing was thus decided highly impractical.

Ultimate plans call for three sets of main runways at the airport. Under stage one, no new runways are to be built. Stage two calls for construction of an additional east-west runway of a possible 12,300-ft. length. This

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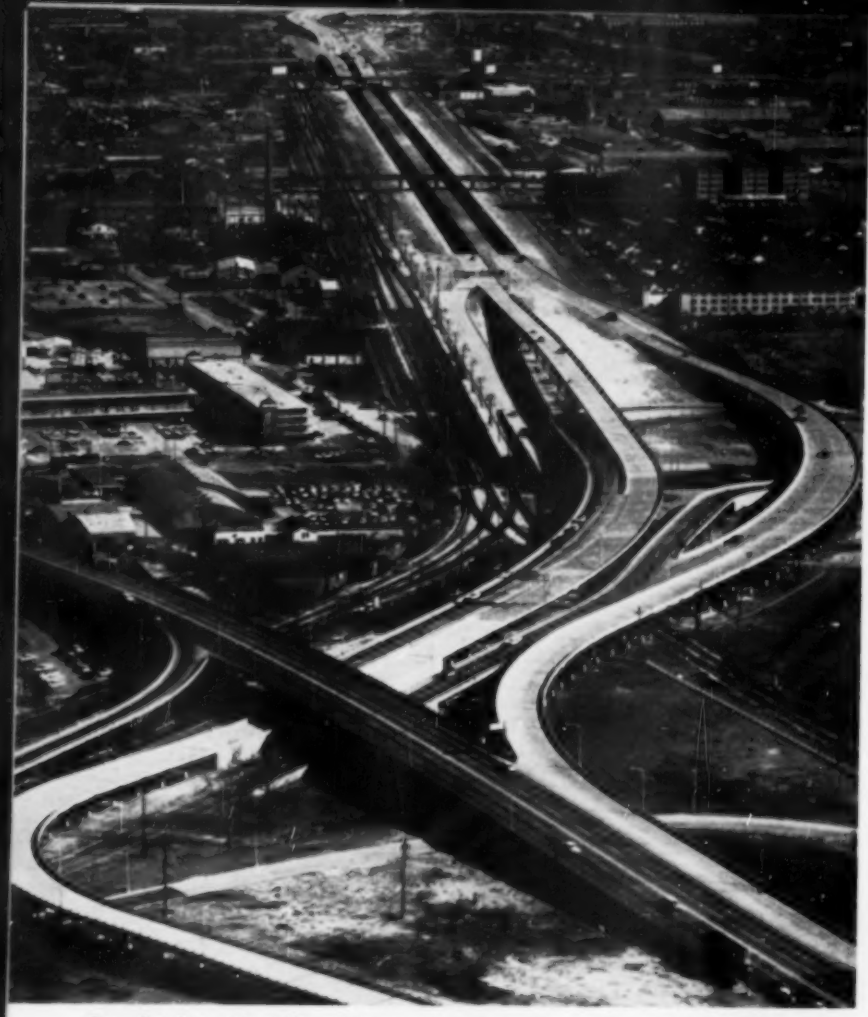


Completed stretch of New Orleans expressway system reaches from downtown area (background) to Airline Highway. Farnsworth contract extends route 1.4 miles to north.

They Dig

While the Sun Shines

And when it starts to rain, the contractor hauls in backfill for this soggy section of the New Orleans expressway system.

WHEN Moses Attaya watches the TV weatherman, he has more than passing interest in the crazy whorls that trace high and low-pressure areas. Rain or shine? He wants to know which. Weather calls the shots on the highway job he runs—a $3,222,000 stretch of the Pontchartrain Expressway in New Orleans.

As job superintendent for Philip R. Farnsworth Co., Attaya has figured a way to beat the rain jinx that plagues roadbuilders in bayou country. When one of those bird-walking storms rolls in off the Gulf, he shifts his forces from digging (which bogs down quickly) to the backfill haul (which doesn't).

Clever job planning like this has kept the contract on schedule despite the weirdest line-up of obstacles anyone would care to take on. Attaya ticks off some on his fingers: Ground water never more than a few feet below the surface; railroad spurs—both across and along the right-of-way; a long-forgotten canal filled with rotted mementoes of bygone days; and, of course, the traffic. Right through the job runs a steady stream of cars and trucks, funneled here by the existing expressway, which will one day hook up to this new link.

"It's like working with a heavy machine gun firing right at you," Attaya observes. But he plans ahead to detour traffic around the areas where his crews work. The place may be torn up like no-man's-land at times, but the motorist always finds a smooth, safe roadway through.

In the last couple of years, New Orlean's expressway system has gained some impressive mileage. A high-level cantilever bridge now carries the superhighway across the Mississippi River just west of the city's center. Early this year, traffic began to roll on a new extension reaching Airline Highway, the main route to Baton Rouge.

The Farnsworth contract takes over from this point, and runs as far north

International TD-15 tractor with Drott front-end handles clean-up chores with ease.

as Mound Avenue—a 1.4-mile stretch. (The outfit also low-bid the next section down the line, some 1½ miles long, where the route swings west to tie in with the interstate system. Attaya will ramrod this job, too.)

The plans show a double-barrel highway with three lanes in each direction. That is just for the main line. Add a frontage street on the west side, and access ramps at the Metairie Road overpass. In places, then, 12 traffic lanes will squeeze into a right-of-way cramped between the railroad and a cemetery.

The plans fail to show one of the big job headaches: water. The tip-off on wet going comes from the cemetery. Almost everybody is buried above ground here—proof that even going 6 feet under taps the water table. Cuts on the Farnsworth job reach well below that level. Where the highway dips under a railroad bridge, digging goes as deep as 17 feet below ground.

(Most of New Orleans lies 5 feet lower than the Gulf. The city has separate systems to collect and pump away sewage, seepage and rainfall. The current contract includes a pump station that will handle storm runoff from the railroad underpass.)

Attaya took on the digging with draglines, satisfied that these rigs could handle the big cuts in one lift. Their advantage, of course, shows up best in this deep digging. The draglines stay topside, on solid ground, as they load out the wet loam. That means the trucks always have firm footing for faster spotting and shorter cycles.

Undercut Roadway

The common excavation item totals 225,000 cubic yards. Almost half of this comes from the dip under the railroad line; the rest is undercut for the pavement subbase. The state wants at least 4 feet of clean compacted sand under all roadways.

Sparking the spread is a Bucyrus-Erie 38-B. The dragline swings a 1¾-yd. Hendrix bucket on its 50-ft. stick. On some cuts, a Koehring 605 with 1-yd. bucket pitches in to boost fair-weather output. A Koehring backhoe opens trenches for drain pipe, and helps rip out street surfacing (a big job, with 37,000 square yards of old pavement to be removed).

The draglines work the cuts full width—about 90 feet in spots—sloping the floor upward as they move back. This gives good drainage, so sump pumps can control water levels in the pit. The black, musty loam presents no digging problem. Often, however, it takes an extra yank on the drag rope to shake stubborn clumps into the haul truck.

"Digging is a real adventure here," a dragline operator tells you. At the moment, the rig's bucket has a good grip on a piece of buried piling, and he's playing it like a game fish.

And there are times the job takes on the aspects of a treasure hunt. No, not pirate booty. But the draglines have struck just about everything else. Biggest cache of debris came from a trench along one side of the right-of-way. Attaya sizes it up as an uncharted canal, abandoned years ago and filled with rare antiques of the day: bed springs, timbers, wheels, canisters—you name it.

The draglines load earth and debris into a fleet of ten-wheel dump trucks. The roster includes five Internationals,

(Right) **Hoe rips out old pavement as it digs trenches for the drainage system. The ¾-yd. rig also pitches in to speed the excavation of footing holes.**

No Place for Guesswork

WHEN you look over a big job like the Pontchartrain Expressway—which is really dozens of little jobs going on at the same time—you wonder how anyone could prevent utter chaos.

"It's easy," Moses Attaya tells you. "Just put everything down in writing."

What the super refers to is his detailed timetable that plans each step of the job well in advance. To implement the plan, he puts out monthly, weekly, and daily assignment schedules.

Sound like a lot of paperwork? Not the way Attaya looks at it. Every hour he spends noodling out a work plan figures to save many hours of confusion in the field.

"When the crew comes to work in the morning, everyone knows where to go and what to do," he says. "And since they soon realize how their part fits into the big picture, they try harder to keep up to schedule."

Fringe benefits of the close scheduling include:

- Less material on hand—They order delivery of supplies just as needed for the job.
- Better traffic control—When traffic flow must be rerouted, detours are set up ahead of time.
- Close coordination with subcontractors—The subs know in advance where they will be needed, and for how long. This helps them plan their work more effectively, too.
- Full-time equipment use—No need to guess how many or what kinds of machines the job calls for today. The schedule lays it all out. When special rigs will be needed, the super can call for them ahead of time, not hunt around at the last minute for a "make do."

Project Superintendent Moses Attaya checks job progress several times a day.

four Macks and one White truck. Each of the haulers carries a 12-yd. payload in its Heil body.

Disposal of the waste is no cinch here. The choice comes down to sell it, or cart it to dumps miles away. Farnsworth found some buyers who needed fill material. But they are a fussy lot. They turn up their noses at loads with big chunks of debris or high concrete content. So, much of the excavated material has gone to disposal areas.

When rain puts a damper on digging work, Attaya goes all out on cuts that are ready for backfill. Placement of the sand subbase course gets top priority. The trucks also haul in fill material for the overpass embankments. The job figures to need about 120,000 cubic yards of sand borrow.

Now if you think it's tough getting rid of waste in New Orleans, you've no idea how much harder it is to find borrow. Farnsworth worked it out, at a reasonable price, by buying pit rights at a Mississippi River quarry run by Jahnke Services.

Replenishes Itself

This quarry is like nothing you've seen before. Call it bottomless, if you will. For as soon as you empty a pit, new sand comes pouring in to fill it up again.

What's the gimmick? Well, the quarry consists of a number of big settling basins. Out in the river, a hydraulic dredge sucks in sand and pumps it ashore. The tail pipe goes to any of the basins that need refilling. No problem with sand supply. As much as the dredge takes out, Old Man River puts back down again—and then some.

The trucks load up at the quarry, then head out onto the city streets for the run to the job. It's no joy ride. Wheeling a loaded tandem through heavy traffic takes skill, especially on rain-slick pavement. The haul distance? On each round trip, the trucks clock close to 17 miles. With seven rigs on the haul, over 1,200 cubic yards of sand have been brought to the job in one shift.

The haulers dump their loads into the cut and a dozer levels off the sand in 12-in. lifts. Traffic of the trucks, plus a couple of passes with a vibratory roller, packs the backfill solid. Now get this bonus of the wet-weather haul—optimum moisture of the sand runs around 17%. Pretty tough to hold that level with a hot sun beating down. But when it's raining, it's a snap!

How's this for a ticklish job—cut off the toe of a spur line embankment to make room for a retaining wall. The object was to gain a few extra feet for the expressway's surface ramps. In all, about 800 linear feet of reinforced concrete wall had to be built.

First step was to drive a sheetpile wall to hold up the embankment during construction. Attaya rented 400 tons of MZ-27 interlocking sections from L. B. Foster Co. His pile driving crew socked the sheets in solid, then went a little deeper just for good measure. The caution paid off. One afternoon in early summer, a storm washed over the city, dumping a good part of the annual rainfall quota in a couple of hours. The sheetpile wall emerged from the deluge bowed, but unbroken.

"It was the storm that could never happen," Attaya recalls. "But we were ready for it. The last thing in the world we needed right then was a railroad in our cut."

After a tractor-shovel pulled out the dirt in front of the sheetpile wall, the workers poured a solid footing. Job-built plywood forms shaped the retaining wall, which varies from 4 to 14 feet in height.

Attaya proudly shows off the job his crews have done so far on the Southern Railroad bridge. He points out the sturdy concrete structure that

(Left) **Prefab reinforcing cage for bridge column is placed with ease. Tubular scaffolding holds cage until forms are set.**

(Right) **Crane swings a 1-yd. bottom dump bucket into place for concrete pour. Wall varies from 4 to 14 feet in height.**

now ends in mid-air, about a quartet of the distance across the work area.

"What you see there," he explains, "is all that remains of the old bridge. We're about to add two more spans to carry the railroad over the expressway lanes. The new section tacks right on the end of the old bridge."

Sounds simple, doesn't it? But the men had to pull some tricky shots to clear away the unwanted parts of the old structure. They removed an end span and abutment without harm to the rest of the bridge.

Before work began, the contractor built a sturdy timber trestle shoo-fly to detour rail traffic around the bridge site. Then a demolition gang placed carefully figured charges in the end span of the old bridge. Wham! The blast dropped the deck as neatly as if it had been sheared off with a sharp knife. Not even a scratch on the concrete supporting pier.

Work is now under way on phase two of the improvement—to remove this pier and build a new end support for the old bridge. The idea is to do it without wrecking the bridge deck. The men built a sturdy grillage of steel beams under the span. When the weight of the deck has been transferred to the grillage, the crew will knock out the old pier. Then they will build the new end support right in under the deck.

Farnsworth has one other major structure on the job—a bridge to carry the expressway over Metairie Road. Building know-how put this phase of the contract on a hot-shot schedule. For instance, crews have streamlined erection of circular columns for the bridge bents. Once a man-killing hefting and sawing operation, this work now steps along at a four-column-a-day pace.

Sub Foundations

What's the secret? Just a modern approach—and the right equipment to make it work. The footings come first. Naturally, in this soggy subsoil zone, piles go under everything that's built to last for more than a couple of weeks. Farnsworth subbed the foundations to Raymond International, experts in concrete cast-in-place pile work. Using a tailor-made rig, Raymond's crew drove 1,200 step-taper piles to support the overpass, the railroad bridge, the retaining wall and the pump house. The piles reached depths of 70 feet to gain required bearing values.

With the footings in, the crack building team takes over. They handle much of the assembly on the ground—a lot safer and faster than old-style forming where carpenters spend more time climbing than they do working.

Reinforcing cages for the columns, each full height and ready for placement, are prefabbed. Then a Koehring 304 crane airlifts the complete cage onto the footing. Tubular scaffolding frames hold the cage upright temporarily.

Then the men bolt together sec-

Continued on page 40

Temporary sheetpile wall is bowed after a heavy rain but holds railroad embankment firmly in place. About 400 tons of L. B. Foster MZ-27 interlocking sections went into wall.

Buried debris and sticky loam are hauled out by 38-B with 1¾-yd. Hendrix bucket. Littered material is wasted.

Heavy lifting chores around the pump station keep an Austin-Western hydraulic crane busy. Station will pump off storm water that collects in railroad underpass.

New Orleans . . .

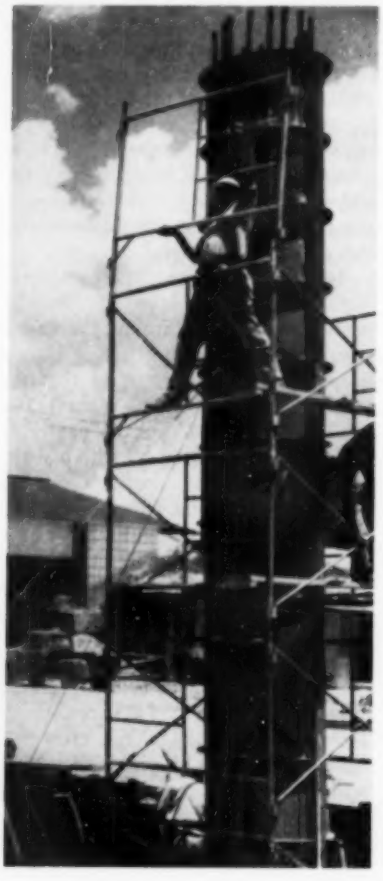
Continued from page 39

tions of Dixie circular steel forms. Why steel? Well, Attaya feels they are cheaper in the long run than any other type of forming for the columns. They almost stand up by themselves. They clean fast, and give a smooth finish no matter how many re-uses they get.

The crane lifts each form as a unit, and slips it around the re-bar cage. Then the men tie four slender wire braces to the form, and pull them tight with small come-alongs. That's all the bracing needed to support the form during a pour, even for columns that measure up to 22 feet in height.

The actual pour takes only a couple of hours. Swinging a 1-yd. bottom-dump bucket, the crane drops ready-mix concrete into the open top of the forms. The men vibrate the mix to work it in and around the re-bar cage. Total time to form and pour four columns—just about 5 hours.

Workers plumb and brace the Dixie steel forms for these 22-ft. high bridge columns in just a matter of minutes.



NEWS

from the

FIELD

Big Drill Augers Caissons

A towering construction drill reaching a height of nearly eight stories has been put in service by Case Foundation Co., Roselle, Ill. Case describes it as the world's largest.

The enormous structure, which weighs more than 120 tons, took approximately a year to build at a cost of over $325,000. It was designed and constructed by Case engineers and mechanics in the firm's Chicago area plant as part of a continuing equipment research and development program.

The new tool will enable Case crews to drill through practically any type of soil down to solid rock depths as low as 200 feet, and to install concrete caisson foundations as large as 15 feet in diameter.

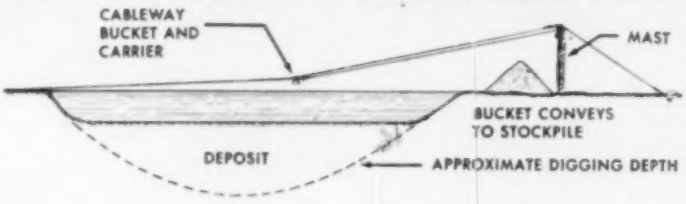
Caissons formerly had been limited to the depth they could be put down by the capacities of the drills. The new drill is expected to overcome natural or man-made obstacles in the ground, including previously impenetrable rock boulders, old cement foundations and other types of obstructions. It also will have the ability to go down deep enough to reach firm, unyielding rock strata to support caissons in any geographical area.

Caissons are end-bearing foundations constructed by pouring concrete into shafts drilled into the ground and are considered far superior to other so-called conventional foundations. The "belled-out" bottoms of the shafts rest on nature's own foundation of bedrock enabling the concrete

Continued on page 42

The Best Method for Digging Under Water is a Sauerman Slackline Cableway

. . . R. W. Bisett, Pres., Olean Gravel, Inc.



A Sauerman Slackline Cableway has been excavating material for Olean Gravel, Inc. since 1930. The 1½-yd. bucket has an operating span of 1200 ft., with an average haul of 900 ft. Depth of the pit is approximately 85 ft.

Due to the long haul and digging depth, Olean uses shovels at the shore line to supplement the Slackline and maintain the 200-tph. capacity of their new plant. Mr. R. W. Bisett, President, states:

"No one has yet come up with a better way of getting material from below the water line than Sauerman."

During freezing winter months when the plant is not operating, the Slackline Cableway is kept running to build a stockpile of material. A 110-ft. mast permits building the pile to a height of about 75 ft. All digging, elevating, conveying and dumping operations are handled by the hoist operator. Gravity return of the bucket to the excavation completes the fast operating cycle.

Where long range excavation or deep digging is required, it pays to use a Slackline Cableway. Contact Sauerman for specific recommendations on your job. Catalog C, *Slackline Cableways*, gives more information on this materials handling method.

SAUERMAN BROS., INC. 622 SO. 28th AVE. BELLWOOD, ILL.
Linden 4-4892 • Cable CABEX—Bellwood, Illinois

Crescent Scrapers • Slackline and Tautline Cableways • Durolite Blocks

New construction drill designed and built by Case Foundation Co. is nearly 8 stories tall and weighs more than 120 tons. Note construction worker making adjustment at top of boom, which rises well above 5-story building in background.

News . . .

Continued from page 41

columns to support structures of almost unlimited dimensions and weight.

Up to now they could not be used in some sections of the Western Hemisphere because of the lack of adequate drilling equipment to perform the job.

The drill is powered by a 375-hp supercharged diesel engine with an Electro-Motive torque converter. Hydraulic rams and air-activated clutches give the operator finger control in operating the giant mechanism. Drilling tools are attached to a three-way telescoping "kelly."

The equipment will be used in installing foundations on large land projects, such as skyscrapers and industrial plants, and for marine construction in Lake Michigan, bridge supports in the middle of the Mississippi River, and offshore installations on the West Coast and in the Gulf of Mexico for the oil industry.

Case officials described the new tool as a major breakthrough in foundation drilling equipment design and said it will be duplicated and sent to all corners of the world for work on various construction projects. It will also serve as the basis of design of other equipment.

Case Foundation Co.'s operations range throughout the entire United States, Central and South America and Canada. In addition to the international home office in Roselle, branch offices are in Detroit, Mich.; San Francisco, Calif.; Windsor, Ont.; Panama City, Panama; and Rio de Janeiro, Brazil.

Plan Pipeline to Deliver Texas-Mexico Natural Gas

A pipeline project to deliver natural gas from a major new source has been announced by Southern California Edison Co., Los Angeles, and Tennessee Gas Transmission Co., of Houston, Tex.

J. K. Horton, Edison president, announced that the project, involving the construction of approximately $225 million in pipeline facilities, calls for the delivery of up to 455 million cubic feet of gas per day from fields in south Texas and the northern part of the Republic of Mexico over a 20-year period beginning in 1962.

"When completed," Horton said, "this project will not only make a substantial contribution in our efforts to minimize smog, but will also constitute an economically attractive and stable fuel supply for use in the steam-electric generating stations which provide electricity for our 4½ million customers in central and southern California."

The pipeline in south Texas will run south to Reynosa, Tamaulipus, Mexico, where it will connect with a new 1,200-mile pipeline across northern Mexico to the vicinity of Mexicali, Baja California, Mexico. New pipelines approximately 280 miles long to be constructed in California will deliver the gas from the California-Mexico border to Edison plants in the Los Angeles basin.

Petroleos-Mexicanos (PEMEX), the Mexican government oil agency, will supply a part of the gas from the fields in northern Mexico and will own the line across Mexico through which the Texas and Mexican gas will be transported for delivery at the international border near Mexicali.

Horton said that plans for the pipeline project will be subject to approval by the appropriate regulatory bodies.

Gold Tailings Yield Gravel

Gravel is more valuable than gold in Oroville, Calif.

A placer gold operation at Oroville, near the state capital of Sacramento, was discontinued because of the low price of gold. Today the millions of tons of gravel from which the gold was washed is to be mined and marketed.

The value of the gravel to be mined

will far exceed the value of the gold previously mined. American Mining & Development Co., Houston, Tex., is putting the former gold operation back into business, as a gravel supplier, to the contractors building a series of dams on the Feather River in northern California.

This series of dams for this north California water-development program is the largest project of its kind developed. The estimated cost of the Feather River project is $1.6 billion.

Because of the strategic location of the Oroville deposits, less than two miles from the site of the largest dam of the project, it is anticipated that the Houston based firm will supply the major portion of the tremendous tonnages of gravel that will be needed for the tremendous project.

The first dam will be larger than the Hoover Dam. This first of the series of dams planned will be 730 feet high—20 feet higher than the Hoover Dam.

American Mining & Development Co. recently acquired the Oroville properties and plans commencement of the operation at the rate of 2,000 tons of gravel per day. It is anticipated that the daily production will be increased as the momentum of demand increases. Since there are seven large dams planned, the demand for gravel is anticipated to be the largest in this area.

As a by-product only, American Mining & Development will wash the gravel one more time for the small amount of gold that is yet to be recovered.

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Curtain Wall Construction Described in New PCA Film

Use of precast concrete panels for sheathing buildings is highlighted in a new film released by the Portland Cement Association. The movie is called *Concrete Curtain Walls*.

The 18-minute sound and color film illustrates nationwide use of concrete curtain walls in structures ranging from single-story commercial and industrial buildings to skyscrapers. It shows the wide latitude offered architects in choice of color, decorative designs, textures and panel shapes, and illustrates how concrete is used to create walls and facades that are eminently practical as well as handsome.

The curtain wall is considered to be a new milestone in the evolution of surface esthetics in architecture. The concrete curtain wall is looked upon as an especially refreshing trend since form and color are easily combined with structural efficiency.

The 16-mm film is especially suitable for showing to architects, engineers, contractors, business and civic groups, and is available on loan through the Portland Cement Association's 34 district offices located in major cities of the United States, and in Vancouver, B. C.

Precast concrete curtain wall panels on this office building in Hartford, Conn., were cast against sand molds created by famed sculptor Costantino Nivola.

EQUIPMENT YOU OUGHT TO KNOW ABOUT

8 to 18-Yd. Quarry and Mine Shovel

Manufacturer: Bucyrus-Erie Co., Department EE, South Milwaukee, Wis.

Claims: A new addition to the Bucyrus-Erie line of quarry and mine excavators is designated the model 270-B. The electric shovel is designed with front-end flexibility to accommodate booms up to 100 feet long, and to handle dipper capacities from 8 to 18 cubic yards.

The 270-B is designed with new control and front-end features. It incorporates new crawler mounting, revolving frame and main machinery advantages, and offers a new elevated, full vision operator's compartment.

A new variable voltage static control system employs magnetic amplifiers with no moving parts. Advantages claimed include trouble-free, instant-response operation; unlimited no-load speed selection within speed range of system; constant load speed up to torque limit; control of drive speed; and high available stalled bail pull in all operating points.

The front-end arrangement features a new-type one-piece boom, with wide boom foot, free of crowd machinery. New components include a snubber-equipped saddle block; screw-type crowd rope takeup; electric dipper trip; equalizer links at A-frame head for bridge strands; and large crowd and retract rope sheaves mounted outside the saddle block.

Design of the 270-B provides for widespread use of alloy steels, enclosed gears and anti-friction bearings.

2-In. Centrifugal Pump

Manufacturer: Henry Sykes Ltd., Department EE, Southwark St., London, S.E.1., England.

Claims: An electrically operated 2-in. "Univac" self-priming centrifugal pump is now available for use where relatively low heads and high suction lifts are encountered. While the maximum head with this pump is 60 feet, the maximum useful suction lift is 26 feet.

The pump has a capacity of 6,500 gph, when operating on a suction lift of 10 feet, at a nominal head. At nominal lift and a total head of 20 feet, the output is 8,000 gph. The pump will pass solids of up to 1-in. diameter and will pump slurries of up to 60% solids content. On a 10-ft. suction the pump will prime in 12 seconds, while on a 28-ft. suction the priming time is 65 seconds.

The operating principle of the Univac pump consists of the maintenance of a partial vacuum in two chambers which are above the center line of the pump and which precede it in the suction line.

The pump and impeller have been designed to handle sludges containing appreciable solids in addition to duties where only clear water is involved.

The pump is close-coupled to a 3-hp English Electric 3-phase 50-cycle 400/440 volt motor although other motors may be fitted as required. The overall length of the unit is 3 feet and the width is 1 foot 6 inches. The height is 3 feet; the total weight is 480 pounds net.

3-Yd. Loader

Manufacturer: Yale & Towne Mfg. Co., Department EE, Batavia, N. Y.

Claims: Trojan's new model 254 tractor shovel is now in production. With 15,000-lb. lifting capacity and bucket sizes from 2 to 3 cubic yards, the machine is designed primarily to fill the gap between the Trojan model 204 in the 12,000-lb. class, and 304 in the 18,000-lb. class.

Features include full power shift transmission, planetary axles, power steering, and four wheel air powered hydraulic brakes. A complete line of attachments give the model 254 job flexibility. Its 24-mph road speed permits fast, easy moves from one job to another.

Trojan's pioneer safety-curve lift arms give maximum protection to the operator, while the extra wide tread and longer wheelbase provides exceptional stability under the most difficult working conditions.

A torque proportioning differential axle permits maximum utilization of power. Both gasoline and diesel operation is available through three engine options. A fully adjustable bucket seat, lights and complete panel instrumentation are provided as standard equipment.

Total weight is approximately 24,500 pounds with an overall length of 20 feet and width (over axle hubs) of 8 feet 10 inches. Forty degree bucket tip back at ground level carry position is provided.

Pickup Truck

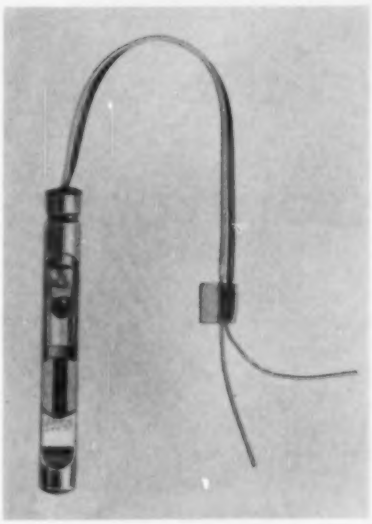
Manufacturer: Ford Div., Ford Motor Co., Department EE, P. O. Box 608, Dearborn, Mich.

Claims: A new type integral cab and body, offering a smooth, clean appearance and promising greater rigidity and longer life, is featured in Ford's new 1961 light-duty F-100 Styleside pickup. The cabs are two inches wider, four inches lower and have lower step-in heights at no sacrifice in ground clearance. The tailgate has new non-rattling latch handles which can be operated with one hand, and the load space has been increased nine cubic feet.

The 1961 Ford pickups have a new grille with single headlights, new heater-defroster, improved electrical system, 28% more glass area and 50% more ventilation.

Available with the "certified economy" 135-hp six or 160-hp V-8, the F-100 features engineering refinements that stress durability, economy and style.

Blasting Caps Feature 38 Delay Periods

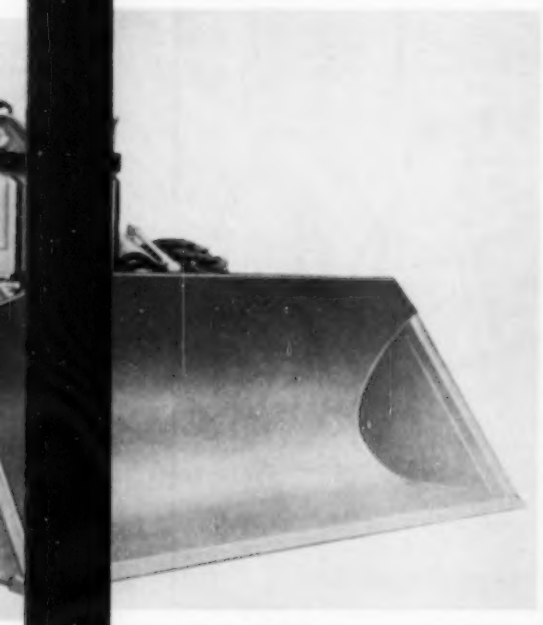


Manufacturer: Atlas Powder Co., Department EE, Wilmington 99, Del.

Claims: Bigger, more productive blasts in restricted areas are now possible with a new extended series of Rockmaster millisecond delay electric blasting caps announced by Atlas. The new series offers a choice of up to 38 millisecond delay periods for a single blast.

Developed for closely regulated shooting such as highway construction in or near built-up areas, tunnel work and sewage systems, the extended Rockmaster series provides in-

Continued on page 48



NOT in the Contract

As a drunk staggered his way homeward from a late party, he pondered the ways of concealing his condition from his wife.

"I'll go home and read," he decided. "Whoever heard of a drunken man reading a book?"

Later his wife heard a noise in the den. "What in the world are you doing there?" she asked.

"Reading, my dear," he replied cheerfully.

"You idiot," she shrilled, as she looked in through the open door, "shut up that valise and come to bed!"

They tell the one about the young starlet who bubbled to her girl friend: "I know he's a cad, but so is his convertible."

Little boy in woodshed: "Father, did grandpa spank you when you were a little boy?"

Father (with paddle): "Yes, my son."

Little boy: "And did great-grandpa spank grandpa when he was a little boy?"

Father: "Yes."

Boy: "Well, don't you think with my help you could overcome this inherited rowdyism?"

An enterprising sailor offered to smuggle a young woman to Hawaii and hid her in a life boat. After several days and nights passed with the sailor spending all his spare time with the girl, she began to wonder why they didn't arrive at their destination.

Finally, she went to the captain of the boat, confessed and told him the whole story. Then she asked: "When will we get to Honolulu?"

"Lady," the captain said, "this is the Seattle-Bremerton ferry."

Mistress: "I'm glad to hear you're engaged, Lizzy. When are your nuptials coming off?"

Lizz: "On our wedding night, and not a day befo'!"

Julius came bursting into the kitchen crying bitterly. "The kids beat me up, Ma—they said I have a big head."

"Now, Julius, just don't believe them. It's not true that you have a big head."

So, partly convinced, Julius calmed down. "Now Julius, run down to the store and get me ten pounds of potatoes."

"Okay, Ma, gimme a bag to carry 'em in," replied Julius.

"A bag? What do you need a bag for?" asked his mother. "Carry them in your cap."

An elderly school teacher got on a bus and took the only empty seat, next to a man who had a little too much to drink.

After a while, she opened her brief case and unfolded a map of Korea to prepare her geography lesson for the following day.

The tipsy gentleman gazed steadily at the map for a while and finally addressed the lady in a worried voice:

"Sure you're on the right bus?"

"How about giving me a diamond bracelet?" proposed the extravagant wife.

"My dear," he patiently replied, "inexplicable circumstances perforce preclude the eventuality of my endowing you with such an estimable bauble."

"I don't get it," she said.

"Precisely."

"Waiter," said the diner who had just sampled his dinner, "these veal chops don't seem very tender to me."

"Sir," replied the waiter, "I used to be a butcher, and I can tell you that less than a month ago those chops were chasing after a cow."

"That may be," replied the man, "but not for milk."

A young teacher was hired as a substitute for a friend who was taking a week off for a honeymoon. Later at a party, someone started to introduce her to the groom.

"Oh," he answered lightly, "I know Miss Jones very well indeed. She substituted for my wife on our honeymoon."

Gas station attendant to car owner: "Your oil's okay, but your engine needs changing."

"Please, Jones! We can do without that motor sound."

Here's why the NEW No. 944 Traxcavator is bringing NEW standards to wheel loader operation

CHECK THESE FEATURES

- **2 cu. yd. bucket**
- **Power shift transmission** and torque converter – provide smooth, instant finger-tip shifting. No clutching necessary.
- **Travel-work range power selection** – travel range gives 2-wheel drive for roading. Work range automatically puts power to all 4 wheels.
- **Precision, 2-pedal brakes** – left brake neutralizes the transmission as it stops the machine . . . throwing all power to hydraulic system. This gives superior loading action in tough material. Right brake leaves the transmission engaged for full control of the machine when creeping or working on slopes.
- **Safe operation** – bucket lift arms and pivot points are completely in front of operator's area. This allows freedom of movement and wide visibility. Steps offer easy access. No need to climb over tires or bucket mechanism. Fenders protect operator from mud and stones . . . provide handy platform for checking engine.
- **Extra long reach** – 50¾" at 7' dumping height – for faster, more accurate loading.
- **Choice of two new engines** – whatever your job or fuel requirement there's a No. 944 powered to meet the need. Diesel engine is compact, 4-cylinder turbocharged for maximum efficiency. Or there's a 6-cylinder gas engine.
- **105 HP*** – delivered from either engine. Plenty of power for machine drive and hydraulic system.
- **4 speeds forward** – 0-24 MPH.
- **4 speeds in reverse** – 0-30 MPH. Reverse speeds are 25% faster than forward speeds to reduce cycle time.
- **Automatic kick-out devices** on bucket control levers – the lift control releases at dumping height. Tilt control positions the bucket for digging.
- **Accessible controls** – forward-reverse lever is located on steering column. Bucket controls are at the operator's right hand. Speed range selector and work-travel lever are on the operator's left . . . within easy reach. The No. 944 has push-button starting.
- **Full line of attachments available** – including forks, cab, special buckets, and the exclusive Caterpillar Side Dump Bucket that gives added efficiency . . . speeds cycle time.

**For comparative purposes, the maximum rating of the diesel engine is 135 horsepower.*

Add 'em up. All of these features are designed to give fast, easy, safe operation. Add bold new design, sound engineering, quality construction, responsible parts and service coverage. All of these make the No. 944 Traxcavator pay off big on any wheel loader operation. See your Caterpillar Dealer. Ask for a demonstration. Compare the No. 944 with other loaders you've seen. Then you'll discover why this machine has all the bonus features and performance potential to bring new standards to wheel loader operation *on your job.*

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

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Packaged in handy 16 oz. aerosol spray-on containers or in bulk — send for a free trial sample.

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HAVE NO MELTING OR DROPPING POINT

Packaged in 14½ oz. cartridges for handy application with lever-type cartridge guns for constant protection to roller, ball, sleeve bearings and sliding surfaces in "hot" bearing applications or in areas with high ambient heat. Exclusive formulas have no melting or dropping point; moisture resistant; will not wash out; exceptional metal adherence properties; temperature reducing qualities; high extreme pressure values. Available in two grades. Whitmore's Anti-Friction Composition No. 1 (light density), recommended for high speed, high temperature applications. Anti-Friction Composition No. 2 (heavy density), for low-speed high-temperature applications or loosely-fitted bearings. Specify No. when requesting free trial sample.

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New Equipment . . .

Continued from page 45

creased flexibility for millisecond delay blasting. This means that where regulations limit the amount of explosives per delay period, more rock can be shot in a single blast.

Besides boosting production, the extended Rockmaster series provides other important benefits. Since more rock is shot in a single blast, fewer shots are required to maintain production schedules. Drilling and earthmoving equipment can work longer and more efficiently. Downtime per working hour is considerably reduced. Also, fewer shots mean less frequent disturbance and therefore fewer opportunities for adverse criticism from nearby residents.

The new extended Rockmaster series of 38 millisecond delay periods is derived from the precision delay timing incorporated in the Rockmaster "16" millisecond delay blasting cap series. The 38 periods fire within a total elapsed time of 3.250 seconds. From zero, the first period fires in 8 milliseconds, the second in 25, and the third through the ninth in 25 millisecond increments. The tenth through 16th are 50 milliseconds apart; the 17th and 18th, 100 milliseconds; and the 19th through the 38th are 125 milliseconds apart. Each period is kept within close timing tolerances to eliminate any chance of overlapping.

The extended Rockmaster series was field tested on a large highway job in Pennsylvania which involved heavy blasting within 200 feet of homes and business places.

"I told you this company was money mad!"

All-Hydraulic Blast Hole Drill

Manufacturer: Schramm, Inc., Department EE, 900 E. Virginia Ave., West Chester, Pa.

Claims: A completely self-contained blast hole drilling rig has been introduced by Schramm. The model C66 crawler Rotadrill mounts all equipment necessary for drilling holes to the depths required in quarry and rock removal operations on a single self-propelled crawler.

The rig is designed for one man operation. All controls for drilling and maneuvering are conveniently located in the operator's cab on the work platform. A separate air compressor is not required since a 600-cfm unit is built into the rig. A rack mounted in the mast holds extra drill pipe ready to be swung under the drive sub and threaded as needed. Optional equipment includes a set of lights which mount on the mast for night operation.

The model C66 is completely powered by hydraulics. The top drive rotation head is powered by variable speed hydraulic motors which can be adjusted to specific drilling conditions. Its design also permits the C66 to be used for drag bit, or tri-cone drilling in addition to ax bottom hole drilling with the Schramm Rotatool. Indi-

vidually controlled hydraulic gear boxes drive each crawler track through roller chains. Hydraulic rams in the mast can exert variable down pressures to 28,000 pounds. A "watch dog" control enables the operator to govern the down pressure to meet varying drilling conditions while a micro-feed control regulates the rate of penetration. Hydraulics also operate the raising and lowering of the mast and outriggers.

The compressor mounted on the C66 delivers 600 cfm of free air at 100 psi. Because all other equipment on the rig is hydraulically powered, this entire air output is utilized in the hole.

The drill offers a choice of two masts, one with 25-ft. travel and the other with 35-ft. travel. With the "Lazy Susan" rack loaded with 4½-in. O. D. drill pipe, the 25-ft. mast enables the operator to drill holes to depths of 100 feet without leaving the work platform to add more pipe. The 35-ft. mast increases this initial depth to 150 feet.

With the Rotatool, holes up to 6½ inches in diameter can be drilled by the bottom hole drilling method. Holes up to 8 inches in diameter can be drilled by the rotary method.

Diesel Truck Engine

Manufacturer: Caterpillar Tractor Co., Department EE, Peoria, Ill.

Claims: Caterpillar's Engine Division has entered the trucking industry market with the introduction of its 1673 diesel truck engine.

With thirty years of experience in the diesel engine field, Cat is a familiar name to engine power users. In the model 1673, truck owners are offered a compact, four-cycle engine of 220 horsepower at 2,200 rpm. It is a six-cylinder turbocharged and aftercooled power plant of 4.5-in. bore and 5.5-in. stroke.

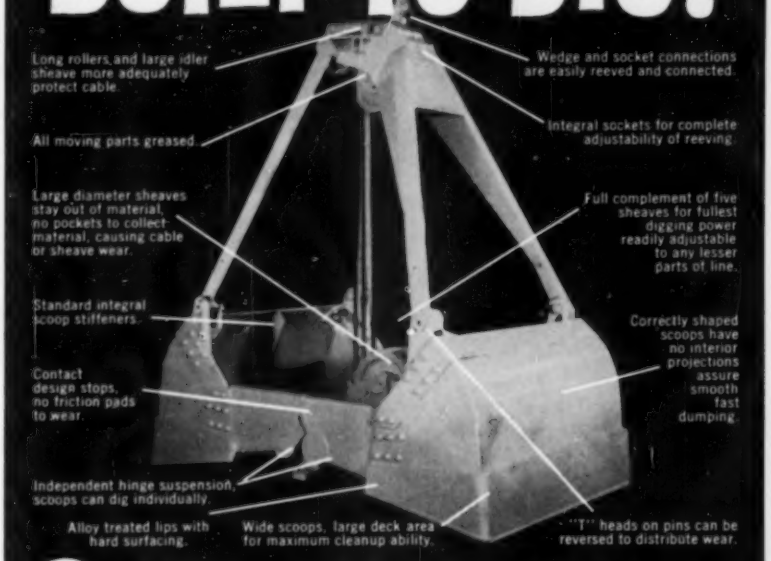
An estimated 85% to 90% of diesel trucks on the road are in the horsepower class to use the 1673. These trucks have gross vehicle weights of 26,000 pounds or more, or gross combined weights of 50,000 to 75,000 pounds.

In the 1,900 to 2,100-rpm range, the 1673 uses only 0.398 pounds of fuel per brake horsepower hour, a very economical rate in truck engines.

New to many truckers will be the

Continued on page 52

BUILT TO DIG!


Long rollers and large idler sheave more adequately protect cable.
All moving parts greased.
Large diameter sheaves stay out of material, no pockets to collect material, causing cable or sheave wear.
Standard integral scoop stiffeners.
Contact design stops, no friction pads to wear.
Independent hinge suspension, scoops can dig individually.
Alloy treated lips with hard surfacing.
Wide scoops, large deck area for maximum cleanup ability.
Wedge and socket connections are easily reeved and connected.
Integral sockets for complete adjustability of reeving.
Full complement of five sheaves for fullest digging power readily adjustable to any lesser parts of line.
Correctly shaped scoops have no interior projections assure smooth fast dumping.
"T" heads on pins can be reversed to distribute wear.

WILLIAMS BUCKETS

Durable clamshell and dragline buckets for every application

Williams Bucket Division, The Wellman Engineering Company, 113 St. Clair Ave. N.E., Cleveland 14, Ohio

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Planet Power-steered..Hi-Lo outblade clutch-steered

With exclusive "live track" Planet Power-steering, the International TD-25 makes full-load, full-power turns—or slams straight ahead with offset loads—where giant clutch-steered rigs slip and slue. With exclusive Hi-Lo, on-the-go power-shifting, the "25" gives you instant cut-to-fill matching of power to condition. You roll up big loads—and keep 'em rolling. With exclusive International DT-817 engine wallop the "25" bulls along, 230 turbocharged hp strong—without "slow-motion" lug-downs, even at high altitudes! Prove to yourself the planet-drive "25" clobbers all comers—outpushes or outpulls 'em up to 50%—*and with standard equipment.* Let your International Construction Equipment Distributor demonstrate.

Dozing volcanic cinders for railroad ballast, this International TD-25 beats the combined production of two similar-sized clutch steered crawlers on the same job! Reason: Hi-Lo power-shifting gives exclusive 4-speed torque-converter efficiency-range control. The "25" delivers heaped loads every pass! To defy "grinding compound" conditions, the "25" undercarriage has heavy-duty Dura-Rollers.

Even with an enormous offset load of shot rock there's no "bank-nosing," no sluing. The TD-25 operator simply runs the load-side track in high-speed range—the other in low-speed range. Result: full-capacity, straight-ahead performance—which the "25" also gives on benching, bank-cutting, and side-casting! In the same way, you make full-load turns—because Planet Power steering eliminates "dead-track drag!"

With Hi-Lo on-the-go power-shifting you shift down, to dig hard material—shift up, to "run" with the load. And to make full-load turns without spillage, use Planet Power steering: down-shift the turn-side track, and you've got it made! When push-loading with the "25", you maintain solid contact on straight-away or curve—to speed heaping the bowls and get gear-higher "kick-outs"!

power-shifted "25's" crawlers up to 50%!

With the same 2-finger ease as on dozing or push-loading, you steer the TD-25 pulling heaviest drawbar tools. This "25" is deep-ripping "concrete-like" mountain clay that has to be shattered before dozer can move it economically. The "25" has the super undercarriage strength of double-box-beam track frames—for full-capacity performance.

International® *Construction Equipment*

International Harvester Co.,
180 North Michigan Ave., Chicago 1, Illinois
A COMPLETE POWER PACKAGE

Same formula as famous Kroil that has pleased 14,000 industrial users for 10 years or more.

Loosens stuck together metal parts, bushings, bearings, bolts, screws, pipe, etc., "anything from an embalmer's needle to a bulldozer," one customer said.

"Like an extra employee," said another. "Turned rust into mush, put $50,000 equipment back to work."

You too can get these results.

Try Aerokroil at our risk. Send $2 cash, and we'll pay postage.

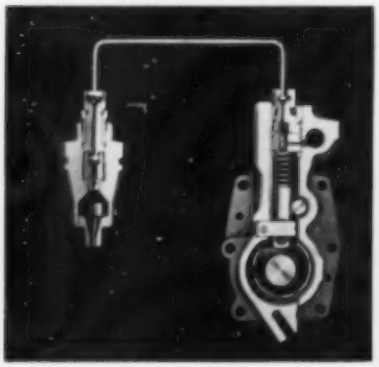
KANO LABS. 1083 Thompson Lane Nashville 11, Tenn.

New Equipment . . .

Continued from page 49

Cat fuel system, which has always been a popular feature with customers of Caterpillar engines. J. G. Edwards, chief engineer of Caterpillar's engine division, explained:

"The precombustion chamber design of Cat engines is the heart of their economical operation and maintenance. In the precombustion chamber, part of the injected fuel is ignited —ramming the main charge into the cylinder under high turbulence to mix fuel and air, assuring full burning at all load conditions including idling. Such complete burning results in clean exhaust, a smooth power stroke and constant power mile after mile. The chamber makes it possible for Caterpillar to utilize a fuel injector with a large single orifice. This eliminates fouling problems in the orifice and greatly reduces the amount of maintenance usually required on truck diesels.



"The large single hole orifice injectors in conjunction with the pre-combustion chamber permit the use of less expensive, heavier fuels. These economy fuels have higher energy values and produce more work per gallon."

The trucker has never before had a fuel system that did not require periodic adjustments. Direct injection fuel systems have to be cleaned as often as 20,000 to 25,000 miles.

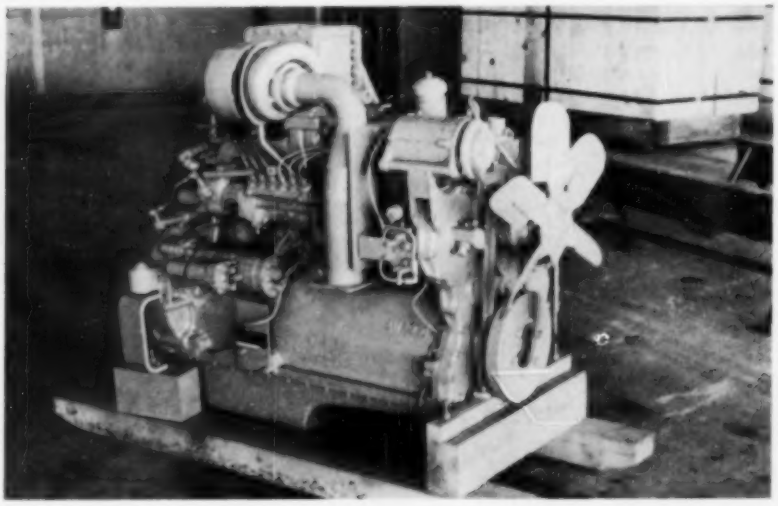
"There is no such need in a Caterpillar "Constant Power" fuel system. With the 1673, the trucker will save on maintenance bills, especially in middle and later engine life. He will get better performance, more power on grades, fewer and lower repair bills—no need to bring power back in middle engine life," Edwards said.

The 1673 engine fits almost every make truck in its horsepower range. It can be placed in the White model 3000, the International model R-210, the Mack model B-61, the Diamond T model 921, the Kenworth model 848 and many other trucks.

The 1673 is similar to the engine used in today's D6 tractor, No. 14 motor grader, No. 12 motor grader, No. 977 Traxcavator and No. 966 Traxcavator. Refinements through the years have brought these high quality engines into the weight and speed range suited to highway trucks, Edwards said.

Caterpillar was a successful pioneer of turbocharging in the earthmoving engine field, and now carries this principle into truck engines.

Turbocharging and aftercooling provide a greater quantity of oxygen for combustion in the cylinders. The turbocharger compresses air and the aftercooler increases its density still further by cooling it. Air leaves the turbocharger at 330° F., and the aftercooler at 200° F. The aftercooler increases power by 20% without adding to peak pressures, and actually reduces peak temperatures.



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CONSTANT HARDNESS THROUGHOUT POINT.

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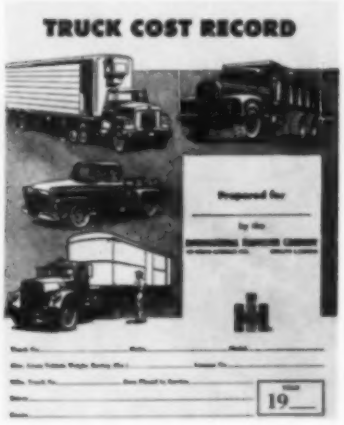
30 YEARS OF EXPERIENCE DEVOTED EXCLUSIVELY TO
THE MANUFACTURE OF DIGGING TEETH

LITERATURE FOR EARTHMOVERS

Subject: **Truck Cost Records**

Content: Truck cost record books and forms for driver daily reports to assist truck users in evaluating the performance of their equipment



are being offered free of charge by the motor truck division of International Harvester. The truck cost record book—form AD-20—consists of 20 pages, and each book allows an accurate record to be kept of all fixed, operating and maintenance charges against one truck for one full year. The driver daily report—form AD-26—may be used in conjunction with the truck cost record book. It provides space for reporting information such as number of trips, trip time, number of stops, mileage, loads, and fuel and oil consumption.

Where to get: International Harvester Co., Department EE, 180 N. Michigan Ave., Chicago 1, Ill.

Subject: **Dredging Report**

Content: How Suffolk County (N.Y.) completed 22 separate dredging projects in three years with the *Shinnecock*, a 12-in. hydraulic pipeline dredge, is told in a two-page technical report by Ellicott Machine Corp. Called *Dredge Ownership Boosts County Program*, the report tells how the *Shinnecock* did economic and efficient work in marina development, placing beach fill, and dredging channels. Giving specific figures for total cubic yards moved and total operational costs per cubic yard for the three-year period, it describes how Suffolk County was able to accomplish more work at less cost with its own dredge. A picture shows the dredge in operation, along with a map of Long Island showing the location of the 22 separate projects.

Where to get: Ellicott Machine Corp., Department EE, 1611 Bush St., Baltimore 30, Md.

Subject: **Pile Shells**

Content: A new illustrated folder from Armco describes the advantages of Hel-Cor foundation pile shells for buildings and bridges. The folder contains useful data, steps in mandrel-driving and how-to-specify information. Ask for PS-7760.

Where to get: Armco Drainage & Metal Products, Inc., Department EE, Middletown, Ohio.

Subject: **Motor Grader**

Content: Caterpillar has published a 12-page booklet describing design and engineering features of the new No. 12E motor grader. Beginning with the new compact engine which powers the No. 12E, the publication works forward through the various components to point up the features which are incorporated. Ask for booklet No. 33799.

Where to get: Caterpillar dealers or Caterpillar Tractor Co., Department EE, Peoria, Ill.

"I'd fire that slow-moving guy if I was running this construction outfit."

Subject: **Crawler Drills**

Content: A 12-page bulletin contains data and operating information on the complete Gardner-Denver line of crawler mounted drilling equipment. Bulletin CDAT-1 offers complete information on drill carriers, drill feeds and various types and sizes of drills. Combinations of this equipment also are graphically illustrated to show the right job usage for any specific drilling application. Construction features, operating features, specifications and other pertinent material are presented in pictures and diagrams.

Where to get: Gardner-Denver Co., Department EE, Quincy, Ill.

Subject: **Backhoe Attachments**

Content: A new four-page Schield Bantam two-color bulletin covers all backhoe attachments and options for the company's crawler-mounted, carrier-mounted and self-propelled crane-excavators. Specifications and work ranges are described along with illustrations of the standard backhoe, long boom backhoe, hydraulic bucket, V-type bucket and rock bucket, together with all the options available. Ask for bulletin BH-60-1.

Where to get: Schield Bantam Co., Department EE, Waverly, Iowa.

Subject: **125-Ton Crane**

Content: The Manitowoc model 14000 lift crane is described in a new 8-page catalog. The crane has a capacity of 125 tons at a 17-ft. radius. Its features include a heavy rotating base with huge hook and house rollers; a big, stable undercarriage; and long, wide-spread crawlers. The unit can easily be put on a standard railroad flat car for fast moves between jobs. Torque converter, double-drum boom hoist of the self-locking worm gear type, disc-type swingers self-removing counterweight, manual or air controls are other features listed.

Where to get: Manitowoc Engineering Corp., Department EE, Manitowoc, Wis.

TO ADVERTISE: All advertising in this section is payable in advance. Rate $1.00 per line, or $12.00 per inch of 12 lines. Minimum charge $4.00. No discounts; no commissions. Please count your copy carefully to avoid delay. Each line contains 41 characters. Count spaces and punctuation as one character each. Be sure to enclose the correct amount of money with your order. Rates and conditions subject to change without notice. Closing date—10th of preceding month. Example: January closes December 10th.

TO INQUIRE: Be sure to address your inquiry to the advertiser by using the listed address. If box number is used, mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

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DRAGLINES, SHOVELS, CRANES, DRILLS, TRUCKS

15-W B-E elec. drag, 215', 12-yd.
450-W B-E diesel drag, 165' w/extra 10, 12, 13 & 14-yd. buckets.
9-W B-E elec. drag, 165', 10-yd.
9-W B-E diesel drag, 165', 12-yd.
7-W B-E diesel drag, 140', 7-yd.
7400 Marion diesel drag, 175', 13-yd.
7400 Marion elec. drag, 175', 12-yd.
1855 P&H diesel drag, 130', 10-yd.
625 Page diesel drag, 160', 9-yd.
621-S Page diesel drag, 125', 7-yd.
200-W B-E diesel drag, 125', 6-yd.
2400 Lima elec. drag, 130', 6-yd.
2400 Lima diesel drag, 130', 6-yd.
4500 Manitowoc drag, 120', 5-yd.
120-B B-E elec. drag, 115', 5-yd.
3900, 3500, & 3000 Manitowoc cranes.
111-M Marion drag, 100', 4-yd.
1601 Lima 4-yd. shovel/drag.
1055 P&H drag, 80', 4-yd.
1201 Lima dragline, 85', 3-yd.
54-B B-E drag, 80', 2½-yd.
5560 Marion 26-yd. elec. shovel.
5323 Marion 18-yd. elec. shovel.
190-B B-E 8-yd. elec. shovel.
151-M Marion 7-yd. elec. shovel.
1600 P&H 6-yd. elec. shovels.
170-B B-E 6-yd. elec. shovel.
4161 Marion 6-yd. elec. shovel.
2400 Lima 6 yd. Std. & H.L. shovels.
120-B B-E & 4121 Marion 4-yd. elec. shovels.
1055 P&H 3-yd. H.L. shovel.
111-M Marion 4-yd. standard & H.L. shovels.
1201 Lima & 54-B B-E standard shovels.
#6 Northwest 1½-yd. standard shovel.
Model T-650 Reich drill truck mtd. rotary and down-the-hole.
Ingersoll-Rand truck mtd. & crawler mtd. Drillmasters.
Keystone #50 truck mtd. Stardrill.
Euclid trucks, rear & bottom dump; dozers, etc.

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313 Hazleton Nat'l Bank Bldg.
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EUCLIDS
Rear, Bottom and Scrapers

12-yd. Bucyrus-Erie dragline.
9-yd. Bucyrus-Erie dragline.
6½-yd. Bucyrus-Erie shovel.
4-yd. Bucyrus-Erie shovel.
4-yd. Bucyrus-Erie dragline.
3-yd. Bucyrus-Erie shovel.
2½-yd. Bucyrus-Erie shovel and dragline.
1½-yd. Bucyrus-Erie shovel.
5-yd. Manitowoc shovels and drags.
6-yd. Lima dragline and shovels.
Large stripping shovels.
Other equipment available, not listed above.

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Construction Equipment
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SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

Bucyrus-Erie 38-B shovel 1½-yd. serial No. 101377 with Cat D13000 engine. Very good condition $31,000
Bucyrus-Erie 22-B heavy-duty hoe, GMC 3-71 diesel, serial No. 119906. Less than 400 hours $27,000
Lorain 41 shovel ¾-yd., Cat D4600 engine, S/N 14597 ..... $6,000
Unit 10-20 truck crane, ¾-yd., S/N 49049, GMC 3-71 diesel. Mounted on Dart carrier, 45' boom. Good condition $8,950
Vibro-Plus CH-30 compactor. 3.5 tons, dynamic impact 7 tons. Waukesha diesel. Demonstrator, like new $5,750
Kiesler 1½-yd. rehandling clam with counterweight type H. Like new $1,900
Esco ¾-yd. orange peel model 379. Excellent $2,125
American double-drum sheepsfoot roller, model AD96 with wedge type feet, 48" width drums, diameter 60", good condition $2,000
Northwest model 25 hoe, ¾-yd. Caterpillar D4600 engine. Very good condition $10,750
Model 300 International tractor with Wain-Roy backhoe, model H700, 12" bucket, both 1956 models in excellent condition $3,750
Wooldridge model BB120, 14 to 18-yd. scraper, tires 18:00 x 24—65% of new. Scraper in good condition $2,500
Model C Scoopmobile with 22' tower and pallet forks, with ¾-yd. bucket excellent condition. Chrysler gasoline engine. Capacity 4,000 pounds $3,900
Bay City model 25 shovel, dragline, hoe combination. Serial No. 6465, 1952 model Caterpillar 315 engine, very good condition, $10,800 with any one front. Add $1,250 for each additional front.
Bucyrus-Erie 15-B—½-yd. dragline, standard tracks 16" treads, 35' boom, very good condition throughout. 1959 model with less than 2,000 hours $15,525
Insley K-12 dragline with 45' boom, fairleads. Serial No. 11289, 1955 model, Buda 326 gasoline engine. Machine in good condition throughout $8,500

CONTRACTORS SUPPLY
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Kansas City, Mo.
Phone: BA 1-7788

EXCAVATORS

1—Link belt model LS-71 ¾-yd. dragline 45' boom; UD-14A International engine. Good condition.
1—Lima 34 combination ¾-yd. dragline and trench-hoe; Cat. D318 engine. Serviceable; clean throughout.
1—Insley K-12 dragline 30' boom, Chrysler 8 engine, ready to go to work.
1—Lorain TL25 dragline, 35' boom; Cat. D315 engine; wide tread 22" pads; rebuilt; a fine piece of equipment.
1—Lima 604 combination 1½-yd. dragline and shovel. HIS Cummins engine; serviced; cleaned and painted.
1—Northwest 1¼-yd. dragline, 35' boom; fairleads; Cat. D7 engine; serviceable or salvage. Make an offer.
1—P&H model 600 shovel, old but serviceable. Make an offer.
1—Bucyrus-Erie 10-B backhoe, S/N 12961, Hercules engine; repaired; cleaned and painted.

EXCAVATOR ATTACHMENTS

1—Lima model 604 shovel attachment complete, good condition, serviceable.
1—Lima 34 hoe attachment 30" dipper, excellent condition.
1—Bucyrus-Erie 22-B shovel attachment complete, clean, serviceable, a bargain.
1—Bucyrus-Erie 38-B shovel attachment 2-yd. Esco dipper, excellent condition.

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

1—Bucyrus-Erie 120-B dragline attachment, fairleads, complete deck equipment, good condition.
1—Osgood 200 hoe attachment, 36" cut plate type dipper, good condition.
1—Schield-Bantam M-49 shovel attachment, good condition.

SCRAPERS AND BOTTOM DUMPS

2—Caterpillar DW20's, turbo charged engines, serviced, cleaned, painted. Rubber fair to good.
2—Euclid model 23-TDT's with model 122-W bottom dump wagons; 6-110 GM engines. Good condition. Located at Los Angeles, Calif.
2—Euclid 14TDT scrapers, Cummins engines, good buys.
2—Allis-Chalmers TS-200's, clean, serviceable, good rubber.
2—Koehring WD-60 Dumptors, cleaned, serviced, painted, good rubber.

MOTOR GRADERS AND MISCELLANEOUS

1—Caterpillar 12 grader, 9K series, new recap tires, no cab.
1—Standard maintenance type asphalt distributor, trailer mounted, complete service, cleaned and painted, ready to go to work.
1—Woods 54 tractor drawn roadmixer, PTO for Cat 2U series, Chrysler engine and accessories. A good clean machine.
1—Universal 20 x 36 roller bearing jaw crusher, cast base, one flywheel grooved, mounted on steel wheel chassis with 24" x 25' conveyor.
1—Caterpillar model 8U dozer mold board and push arms, clean, ready to go.
1—CMC 16's concrete mixer with Winslow unibatch and scale complete. A good machine throughout. Priced to sell.

THE COLORADO BUILDERS' SUPPLY CO.
1534 Blake Street Denver 2, Colo.

BACKHOE & CRANE

1—Link-Belt model LS-80 crane with 50' boom, Rudomatic tagline, Buda gas engine, s/n 7074
1—Link-Belt model LS-60, Buda gas engine, s/n 8128.
1—Bucyrus-Erie 10-B crawler-mounted backhoe, s/n 16626; powered by Buda model 326-hp. 6 cylinder gasoline engine, s/n 11579. Backhoe with 14' boom, 4'6" stick, 29" wide bucket at side cutters with 3 teeth mounted on 9' long x 7'8" wide crawlers with 14" pads.

DRAGLINE

1—Bucyrus-Erie 10-B gasoline powered backhoe, standard cats, excellent condition, s/n 20429.

MISCELLANEOUS

1—LeRoi 315 air compressor on 4 pneumatic tires, 7 or 8 years old.
1—Ruhr M-1—½-cu. yd. heavy-duty grapple, new, excellent buy.
1—Wayne 36" rider industrial vacuum pick-up sweeper, demonstrator, 2 years old.
1—CMC Jetcrete with all accessories. Excellent condition, practically new with all extra accessories.
1—Used Kennedy-VanSaun revolving scrubber screen, 48" dia. x 21' long, in excellent shape and complete with all new parts including extra scrubber sections and new sizing screens.
2—Caterpillar D13000 power units in good shape with radiator less clutch, s/n 3R8157SP and 3R8098SP.
1—Clark 10,000-lb. fork lift, solid tires.
1—Towmotor LT44 with pusher attachment on solid tires.

S. M. CHRISTHILF & SON, INC.
Timonium Rd. & Harrisburg Expressway
Timonium, Md.

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

Bucyrus-Erie Model H-5 Hydrocrane, serial #119382, complete with tagline reel and clamshell bucket. Mounted on ten wheel International truck. Entire unit delivered new May 1959. Very low hours and in excellent condition throughout.

Bucyrus-Erie model 10-B dragline, serial No. 88595, with Buda gasoline engine, 28' crane boom. Good working condition $3,500

Bucyrus-Erie model 38-B 1½-yd. shovel, serial No. 112162 with Caterpillar D13000 diesel engine, Kohler light plant, standard crawlers with 33" treads. Location—northern New Jersey.

Bucyrus-Erie model 51-B 2½-yd. shovel, serial No. 62581 with Caterpillar D17000 diesel engine, standard crawlers with 36" treads. Low hours. Reconditioned and in very good condition throughout.

Bay City 45 ¾-yd. backhoe, serial No. 5993 with Caterpillar engine, standard crawlers. Reconditioned and ready to work. $13,750.

Osgood Model 800, serial No. 3569, dragline, 50' boom, extended crawlers, 30" treads. Waukesha gasoline engine. Machine like new with less than 1,000 hours use..$14,500

Michigan model TMD, T-16 truck crane, serial No. 8046, 60' boom, pendant suspension, Rudomatic tagline, backhoe attachment, mounted on ten wheel factory carrier. Very good condition throughout $13,000

Bucyrus-Erie Hydrohoe attachment for H-3 Hydrocrane complete with 18" general purpose dipper, 20" utility dipper, 12" narrow dipper and all necessary fittings. Excellent condition. Complete $750

Bucyrus-Erie 22-B shovel front complete with dipper trip, chains and lagging. Good condition $1,500

Lorain ¾-yd. shovel front, Amsco bucket complete with dipper trip. Excellent condition throughout $1,500

Bay City 45 ¾-yd. shovel front complete with dipper trip. Good condition ...$1,500

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MUrdock 8-0060

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Caterpillar D8 tractor, cc. guard, 24" tracks, elec. starter, oil clutch w/Cat 8S hydr. bulldozer. Good operating cond. $12,500

International TD-24 Tractor, cc. guard, 24" tracks, pull hook, canopy, dozer, double drum PCU. Good undercarriage. Good operating cond. $10,500

International TD-18A tractor, cc. guard, 20" tracks, canopy, hydr. dozer. Operating cond. $4,500

BACKHOES

Bucyrus-Erie 22-B S/N 69159, ¾-yd. hoe, 26" tracks, Buda gasoline engine. In process of repair. Inquire for price.

Bucyrus-Erie 15-B backhoe, S/N 50787, ½-yd. capacity, 20" tracks, Buda 326 gasoline engine. As insp. $7,500

CLAMSHELL

Lorain 820, 2-yd. crane and clamshell, 65' boom, pendant suspension, 34" tracks, Rudomatic tagline, Cat D13000 diesel engine, S/N 18523. Rebuilt and guaranteed $13,000

TRUCK CRANE

Northwest #25 truck crane, S/N 12454, 40' boom, telescoping boom stop, outriggers and floats, Dart carrier, 10 Michelin 11:00x 20 tires, gas engine. Good operating cond. —As insp. $18,350

SHOVEL ATTACHMENTS

Bucyrus-Erie shovel attachment for 38B complete with deck machinery and standard 1¾-yd. dipper. Like new. $8,900

Lorain 820 fairlead attachment. Good condition. $550

Northwest No. 25 fairlead attachment. Excellent cond. $520

Haiss ¾-yd. clamshell bucket with teeth. Good condition. $1,000

Pettibone Mulliken 2-yd. dragline bucket complete with chains and bridle. Good condition. $2,200

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SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

SHOVELS, CRANES & ATTACHMENTS

Bucyrus-Erie model 22-B, ¾-yd. dragline and clamshell combination. 40' boom. Powered by International UD-525 diesel engine. Less than 3 years old. From our rental fleet. Excellent condition. $18,750. FOB Elizabethtown, Ky.

Bucyrus-Erie model 15-B, ½-yd. dragline with 35' boom, 20" treads. Powered by International UD-9A diesel engine. $9,500. FOB Louisville, Ky.

Bucyrus-Erie model 15-B, ½-yd. shovel, powered by Caterpillar D4400 diesel engine. Electric starting, good operating condition. $5,500. FOB Elizabethtown, Ky.

Bucyrus-Erie model 10-B dragline, powered by gasoline engine, 35' boom. $5,500. FOB Evansville, Ind.

Lorain model 820, 2-yd. shovel, powered by Caterpillar D13000 diesel engine. $13,000. FOB Elizabethtown, Ky.

Lorain model 40, ⅜-yd. shovel on crawlers. Powered by gasoline engine. $4,500. FOB Elizabethtown, Ky.

P&H model 255-A, ¾-yd. shovel, crawler mounted. Powered by Caterpillar 315 Diesel engine. $8,500. FOB Elizabethtown, Ky.

Lorain model TL-20 dragline with 45' boom. Waukesha gas engine. Undercarriage rebuilt. Good operating condition. $7,000. FOB Evansville, Ind.

General model 307, ¾-yd. dragline with 45' boom and fairleads. Powered by Waukesha gasoline engine. $5,250. FOB Evansville, Ind.

Unit ½-yd. shovel, powered by Chrysler Industrial gasoline engine. $3,000. FOB Evansville, Ind.

Write—Wire or Phone Jim Waddell

BRANDEIS MACHINERY & SUPPLY CO.
Louisville 1, Ky.
P. O. Box 1705 MElrose 7-4741

Used Bucyrus-Erie 54-B 2½-yd. shovel. Serial number 77116; Buda diesel model 6 DC-1879, serial number 49235-F. Good operating condition. Only one owner who purchased it new. Priced for quick sale. $25,500. Can be seen at our Dallas yard.

BROWNING-FERRIS MACHINERY CO.
Houston - Dallas - Longview - Lubbock
Texas

FOR SALE OR LEASE

Lima 2400 dragline, 120-ft. boom, powered by Cat D397 engine with torque converter, 25-ft. crawlers, 63-in. pads, new 1956, excellent condition. Job completed reason for selling. Located Cal-Sag Canal near Chicago, rail or water shipment.

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JE 5-4482

1—B-E 22-B heavy-duty crane-dragline, sn 118207
1—B-E 22-B heavy-duty crane-dragline, sn 113866
1—Cat D7 angle dozer, sn 17A-13977
1—Cat D6 angle dozer, sn 17A-3684
1—Cat 212 motor grader
1—Allis-Chalmers scraper 8-10 cu. yds.
1—Brownhoist Ind. hammer, double acting
1—McKiernan-Terry hammer model 3-C, double acting
1—2,200-lb. drop hammer & headblock
4—F600 1958 dump trucks
1—1956 T800 tractor
1—30-ton Dorsey trailer w/outriggers
4 pickup trucks

All equipment in excellent condition.

JAMES CHANCE CONTRACTOR
P. O. Box 1674 New Bern, N. C.
Phone ME 7-4294 or ME 7-6730

MISCELLANEOUS EQUIPMENT

DRAGLINES

Model 22-B Bucyrus-Erie, ¾-yd., Cat D318 diesel engine, long frames, 30" treads, 1955, excellent condition $20,000

Model 22-B Bucyrus-Erie, ¾-yd., G.M.C. 3-71 diesel engine, 12' long frames, 26" treads, 1948, good condition $10,500

Model 22-B Bucyrus-Erie, ¾-yd., Buda K-428 gas engine, 12' long frames, 26" treads, 1955, very good $15,000

Model 15-B Bucyrus-Erie, ½-yd., 30' boom, fairlead, gas engine, good condition, ready to work $7,500

Model 34 Lima, ¾-yd., Cat D318 diesel engine, 45' boom, fairlead, long cats, good condition $8,500

Model 34 Lima, ¾-yd., Buda gas enine, 45' boom, fairlead, 30" crawler treads, good condition $8,500

Model 45 Bay City, Cat D4600, ¾-yd., fairlead, 45' boom, long crawlers, 26" treads ... sound condition $6,500

SHOVELS

Model 22-B Bucyrus-Erie, ¾-yd., G.M.C. 3-71 diesel engine, 12' long crawlers, 26" treads, 1948, good $10,500

Model 22-B Bucyrus-Erie, ¾-yd., Buda K-428 gas engine, 12' cats, 26" treads, 1955, very good condition $15,000

Model 34 Lima, ¾-yd., Cat D318 diesel engine, 1948, 26" treads, good condition $8,500

Model 34 Lima, ¾-yd., Buda gas engine, 26" crawler treads, 1949, good condition ..$8,500

Model 15-B Bucyrus-Erie, ½-yd., gas engine, unused shovel attachment with new dipper, good condition $7,500

Model 375 American, ¾-yd., Waukesha gas engine, working condition, ¾-yd. shovel dipper $2,750

Model 55 Lorain, ¾-yd., UD-18 I.H.C. diesel engine, partially overhauled, old but will still produce $1,750

HOES

Model 22-B Bucyrus-Erie, ¾-yd., Cat D318 diesel engine, 1955, long cats, cambered boom, 29" dipper, excellent $20,500

Model 34 Lima, ¾-yd., Cat D318 diesel engine, long cats, cambered boom, very good condition $9,750

Model 34 Lima, ¾-yd., Buda gas engine, 1948, long crawlers straight hoe attachment, good condition $8,500

Model 11-B Bucyrus-Erie, ¾-yd., truck mounted rental unit, 36" and 22" dippers, special discount. Call for price.

TRUCK CRANES

Model "L" Quickway, 10-ton lifting crane, gas power, 80' boom. Available truck carrier, good sound condition $7,950

Model 11-B Bucyrus-Erie, 10-ton lifting crane, Continental gas engine, 6 wheel drive carrier, low hours, excellent ... Call.

LIFTING CRANES

Model 1500 Manitowoc, 1-yd. Waukesha gas engine, 80' boom, good condition, old but dependable $7,950

Model 45 Bay City, Cat D4600 diesel engine, 45' boom, good condition, reduced in price to sell $6,500

Model 22-B Bucyrus-Erie, Cat D318 diesel, long crawlers, 30" treads, 40' boom, independent boom hoist $19,500

Model 357 Unit rubber tired wagon crane, 7 ton capacity, Chrysler engine, 30' folding boom, excellent $8,500

Model H-3 Bucyrus-Erie Hydrocrane, 1952, Ford F-6 truck chassis, 2 piece boom, cab, excellent $6,950

Model H-3 Bucyrus-Erie self powered Hydrocrane, Ford F-7 truck chassis, 2 piece boom, cab, 1955 ....$9,500

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Lower track rollers w/bushings for:
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New and guaranteed

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Bucyrus-Erie 15-B center boom section, 15 feet long—unused.
Lima 34 swing-type fairlead—unused.

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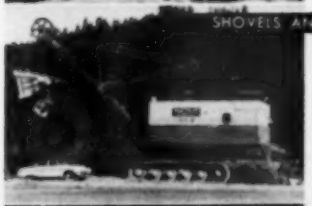
CALIFORNIA

Liquidating $14,000,000.00 worth of well-maintained, top name equipment at BARGAIN PRICES!

CONVEYOR SYSTEM

2 miles long, 42" wide rubber belt. 9 flights, available individually, ranging from 672 ft. long to 1885 ft. long. Braking by electric motors acting as generators under belt load; also mechanical brakes. System includes drive-over hopper loading station for scraper discharge, screening and crushing plant, three drive-under terminal bins with total capacity of 1500 cu. yds.



SHOVELS AND DRAGLINES

2—Model 150B Bucyrus Erie 6 cu. yd. Electric Shovels and Draglines (Note: 8 cu. yd. Dippers w/handles available for above); 1—Model 120B Bucyrus Erie 5 cu. yd. Electric Shovel and Dragline; 1—Model 38B Bucyrus Erie 1½ cu. yd. Shovel, Dragline, Backhoe, diesel; 1—Model 22B Bucyrus Erie ¾ cu. yd. Shovel, Dragline, Backhoe, diesel.

MOTOR PATROLS

9—Model 12 Caterpillar Motor Patrols, 8T, 80D, 70, and 71D Series.

HAULING UNITS

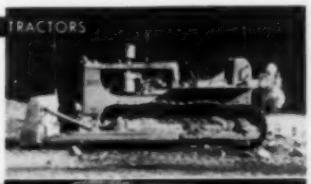
8—Model LRVX Mack Tractors w/Model 137W Euclid 30 cu. yd. Bottom Dump Trailers powered by NVH-12-B1 Cummins Engines; 10—Model PH95AC International Payhauler Tractors w/Model PW20 30 cu. yd. Athey Bottom Dump Trailers.

END DUMP EUCLIDS

5—Model 46TD Euclid End Dump Units, 15 cu. yd., powered by Model NHRBIS Cummins Engines; 10—Model 63TD Euclid End Dump Units, 15 cu. yd., powered by Model 6-110 GMC Engines.

LOADERS

1—Model 175ADS Michigan 3 cu. yd. loader powered by Model 135DKBS Waukesha Engine; 1—Model D4 Caterpillar Loader w/Model EA4 Trackson Loader.



CRAWLER TRACTORS

15—Model D9 Caterpillar Tractors w/P.C.U.'s and Dozers, 18A Series (Note: 4—Ateco Hydraulic Rippers available for above); 21—Model D8 Caterpillar Tractors w/P.C.U.'s and Dozers, 14A Series (Note: 6—Caterpillar 22B Hydraulic Rippers available for above).

RUBBER TIRED TRACTORS

30—Model DW20 Caterpillar Tractors w/Model 456P Modified Scrapers, 67C and 88E Series; 10—Model DW20 Caterpillar Tractors w/Model PW20 Athey Wagons, 88E Series; 2—Model 33LDT Euclid Tractors w/Model 32SH Scrapers.

QUARRY DRILLS

1—Model TWM2A Joy Quarry Drill w/T500 Drills, pneu. tires; 3—Model TWM-5 Joy Quarry Drills w/T500 Drills, pneu. tires.

SPRINKLER TRUCKS

1—3400 gal. Model CF523C6 Kenworth powered by Model NRT6B1 Cummins Engine; 1—3400 gal. Model R1F402 International powered by Model NHB Cummins Engine; 1—3600 gal. Model RDF192A International powered by Model JBS600 Cummins Engine; 2—6000 gal. Model 46TD Euclid powered by Model NHRBIS Cummins Engine.

DUMPCRETE

5—4 yd. Dumpcretes mounted on International truck.

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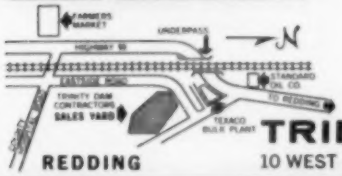

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MISCELLANEOUS EQUIPMENT

International TD-6 tractor, excellent condition. Running gear 65% to 70% good. A real nice unit for drawbar work $1,600

Caterpillar model D6 tractor, 9U series, 6A dozer. Double drum rear cable control. Guarded up and with operators guard. Undercarriage components 50% good. Good operating condition $7,500

Caterpillar D6 tractor, 9U series. Guarded up and with operator guard. Undercarriage components average about 30% good. Rails still rebuildable. Operates good $2,875

International TD-18, 181 series, with new type angledozer, allied rear double drum cable control. Guarded up. Undercarriage averages 60% good. Checked over in our shop. General appearance excellent. Has steering booster $10,500

International TD-6, wide gauge, with new Holt free-spooling skidding winch, Holt hydraulic angle dozer, with front mounted pump. All the guards including overhead operator guard. This machine has been checked over and repaired as necessary. The appearance is very good. Is in good operating condition. The undercarriage averages 60% good $4,750

Caterpillar D6 tractor, 9U series, guarded up, good tractor or drawbar work....$2,500

International TD-18A-181 series, equipped with C-frame and Allied rear double drum cable control unit, all guarded up, rollers and sprockets, idlers, average 50% good, links 25% good, grousers 10% good. Right hand steering clutch has been overhauled, unit checked over, has hydraulic steering boosters $5,000

Caterpillar D4 tractor, 6U series, equipped with angle dozer, real good condition.$3,750

Allis-Chalmers HD6G shovel loader, serial No. 2254 with 1½ cubic yd. bucket. Worked a total of 3,600 hours since new. Engine completely rebuilt with new liners, pistons, bearings, and head. Checked over master clutch back including final drives, pins turned. Roller and idlers built, very good operating condition, 30-day guarantee. $10,750

International TD-6 with track, crankcase, radiator guards, operator guard. Straight hydraulic dozer. Checked over, repaired. $2,250

Oliver Cletrac OC-6 tractor with guard equipment, rear mounted skidding winch, Holt hydraulic straight dozer, front mounted on hydraulic pump. All steel operator guard. Good operating condition $2,500

International TD-14, equipped with Isaacson cable controlled angle dozer and Isaacson double drum cable control. Operator guard, roller and crankcase guards. The engine clutch and transmission have been completely rebuilt; rollers, idlers have been rebuilt and new rails installed $8,750

MISCELLANEOUS EQUIPMENT

Cletrac DDH tractor equipped with hydraulic angle dozer, wide gauge general appearance good. Tracks good operating condition $800

Caterpillar D4 tractor, 60" gauge, 7U series, with track roller guards, radiator crankcase guards, all steel operator guard, rails, rollers, idlers rebuilt, steering and master clutch final drives repaired. No. 4A angle dozer with No. 44 hydraulic control. Also equipped with a LeTourneau skidding winch. Excellent operating condition. 30-day guarantee $7,500

Caterpillar D7 tractor equipped with 7A cable controlled angle dozer, front Caterpillar No. 24 cable control and Hyster Hyspeed skidding winch, operator guard, roller guard, has new tracks. This machine has been completely remanufactured. Bonded buy. 90 day guarantee.....$15,000

Wooldridge pull-type ripper for use behind D7 or D8, 2-teeth equipped with new shanks adaptors, and points, over $500 in repairs put into rebuilding this ripper. $1,750

LeTourneau model J 8-yd. scraper, good condition, rubber 40% good $1,500

Caterpillar D6 tractor, serial No. 9U 10943, with a 6A angle dozer, front mounted cable control, and Hyster Hyspeed skidding winch. Engine, master clutch, transmission, final drives, steering clutches, all checked and repaired as necessary. Undercarriage averages over 75% good. All guarded up including an all steel overhead operator guard. 90 day Bonded Buy guarantee $14,500

Caterpillar No. 23 double drum cable control, will fit on D6 tractor $250

Caterpillar D2 tractor, with No. 44 Caterpillar hydraulic control and 2A Caterpillar dozer. Roller guards. Over $2,100 put into this machine in repairs. In excellent operating condition. Guaranteed for 30 days. Certified buy $4,500

Caterpillar D2 tractor, 5U series, with 5-roller non-oscillating frame. Equipped with a new Teale bucket loader, ¾-yd. bucket, running gear averages better than 60% good. The machine has been completely through our shop and engine completely rebuilt including a new block. This machine is guaranteed for 30 days ..$6,500

Caterpillar #25 double drum cable control for D8 .....$1,050

Allis-Chalmers AD45 motor grader, late current model, tires better than 65% good, 13.00 x 24 rubber on all wheels, cab, cab heater, lights, scarifier, and 14' moldboard, all necessary repairs made, excellent operating condition. Used 40 months since new. $7,500

LeTourneau No. H3C ripper, equipped with two teeth, two tips 50% good. Balance of ripper in good condition and complete with cable $1,250

MISCELLANEOUS EQUIPMENT

P&H ¾-yd. shovel, equipped with a 55-ft. crane boom, extra counterweight, tractor type tracks with 20-in. flat grousers, powered with a Chrysler industrial gas engine, three-speed transmission on the upper works. General appearance good $6,500

Insley ⅝-yd. shovel, equipped with a logging boom. Powered with a Chrysler 6-cylinder gas engine. Machine in operating condition, has fairlead for dragline operation $3,500

Pioneer 6-ft. x 30-in. type A, 2-chain with flared sideboards, apron feeder, appears like new. Sells for $2,450, new. Used only 90 days $1,800

Galion 10-ton 3-wheel steel roller, powered with Buda gas engine, engine has been completely rebuilt. Front wheel repaired. Checked and repainted. Put over $1,200 into repairs. Good operating condition. 30-day guarantee $1,750

Portable sawmill on heavy timber base, 48-ft. double track, 6-ft. x 9-in. carrier with two knees, single dog, (carriage could be lengthened for long lumber) friction feed works, 56-in. circle saw, 48-in. flywheel, one live feed roll, 25½-in. flat pulley drive, 18-ft. tail rolls. Anti-friction bearings throughout major portion of mill. This is a heavy-duty portable mill ..$3,000

Barber-Greene pugmill, model 848. Heavy-duty mixer with 8-ft. steam jacketed twin shaft pugmill, aggregate hopper, apron feeder, pneumatic tires, air brakes, 700-gallon insulated Bituman tank, distillate burner, 3-in. Kinney metering pump, necessary hood connections for loader, discharge chute, 3-in. Viking transfer pump, 145 hp UD18A International diesel engine. Price on application.

American single-drum truck-mounted skidding jammer. Complete with cable blocks and booms on single axle GMC 450 truck. Runs good $1,500

Bucyrus-Erie 38-B shovel, powered with a Caterpillar D13000 diesel engine. Price on application.

Gardner-Denver 125-cfm air compressor, trailer-mounted. Guaranteed for 90 days. $2,750

Bucyrus-Erie 51-B shovel, equipped with a Buda 6DC 1742 motor. Price on application.

Ingersoll-Rand 315-cfm Gyro-Flo rotary air compressor. Powered with a GMC 371 diesel engine. Has the appearance and condition of a new machine. Excellent operating condition. Half the price of a new machine. Guaranteed 30 days $6,750

We also have a large quantity of jackhammers and mining equipment.

WESTMONT TRACTOR CO.
150 E. Spruce — Missoula, Mont.
P. O. Box 1445

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AIR COMPRESSORS

1—Used Ingersoll-Rand model DR-900 Gyro Flo air compressor, with General Motors 6-110 diesel engine, temperature control switch, air glide cap, control, elec. start, oil bath air intake filters, multiple leaf steel spring suspension, traffic reflectors, A.S.M.E. air receiver, muffler, special fittings for state of Mass., and mounted on four pneumatic tired wheels, complete with standard equipment. Serial number 900LR16248. Tire Size: 7:50 x 20 good condition. The above unit was purchased new in July 1958. It is in excellent condition; the hours worked are 2,290. Priced for quick sale.

1—Used Chicago Pneumatic model 900 class RO-2 two-stage, oil-cooled Cummins NRTO -6-VI supercharged diesel engine driven rotary portable air compressor. Complete with standard equipment. Serial number 64652. Mounted on 6 x 6 International truck #RED 36126375. Tire size 8:25 x 20. The above unit was purchased new in August 1958. The hours worked are 2,140. Priced for quick sale.

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HUbbard 8-7251

Waukesha Hesselman engine, model 6EKH 7x7, 189 hp, 1,000 rpm, in running condition. Cheap.

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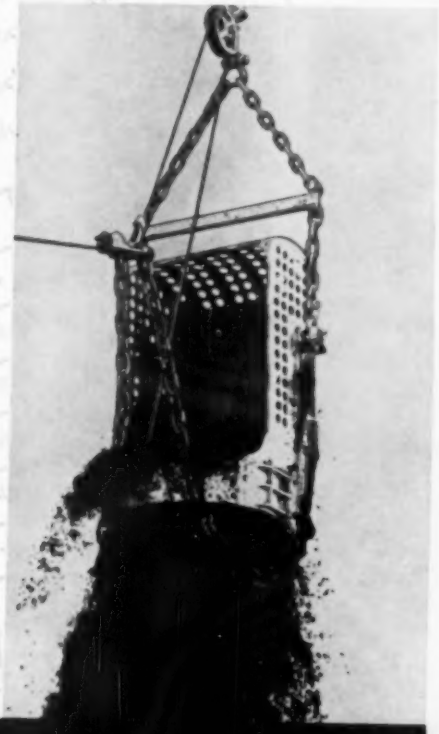

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Fill Faster

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Dump Cleaner

"A Type for Every Digging Purpose"

¼ to 40 Cubic Yards

HENDRIX MANUFACTURING CO., Inc.

MANSFIELD, LOUISIANA

Hendrix Lightweight Dragline Buckets

CLEVELAND DIGS SHALE AND ROCK 3-5 FT. DEEP FOR HIGHWAY DRAINAGE

THE JOB: 20 miles of drainage trenching in both inner and outer shoulders of five miles of dual highway for the relocation of U. S. Route 25 near Middletown, Ohio.

CONDITIONS: trench to be cut to grade, 18 inches wide, 3 or 5 feet deep depending on inner or outer shoulder, through very densely compacted shale and rocky material, further densified because much of the grade carried hauling equipment all through a winter, spring and summer.

PERFORMANCE: despite need to replace worn bucket teeth more frequently than usual because of the tough digging, a Cleveland J-40 dug the trench to accurate grade at the rate of 1,800 to 2,000 feet per 9 hour day.

J-40 FEATURES

- Stability—on wide-spaced crawlers, 1000-hour-lubricated
- 100% control of every operation at the operator's seat
- V conveyor for faster, higher, more efficient spoil discharge
- Pulley-enclosed dual, independent, conveyor drive
- Automatic conveyor shifting from side to side
- Over 30 non-slipping digging speeds
- Digs trench 17½ to 30 inches wide, down to 5½ feet deep.

WRITE TODAY for Bulletin L-110, a detailed report on the performance of the J-40 on this tough highway drainage job.

CLEVELAND TRENCHER

THE CLEVELAND TRENCHER CO., 20100 ST. CLAIR AVE., CLEVELAND 17, OHIO